

your computer

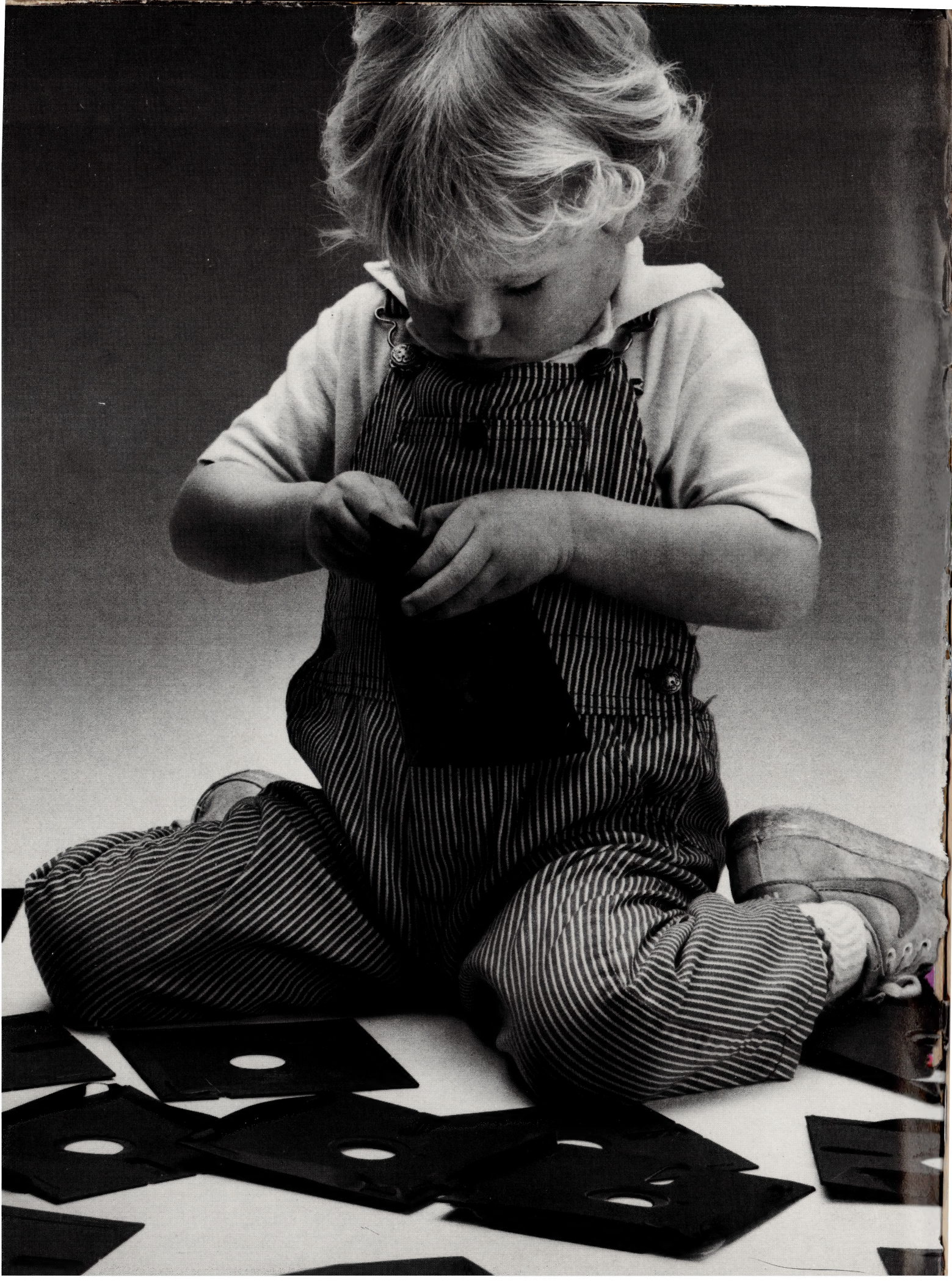
October 1985

\$2.95* NZ \$3.50

MAKING YOUR MICRO WORK



DATA
COMMUNICATIONS
THE ELECTRONIC PARTY LINE



Herbie Briggs has just destroyed the myth that all floppy discs are created equal.

They seem equal. Until you look at the seams.

That's where equality ends.

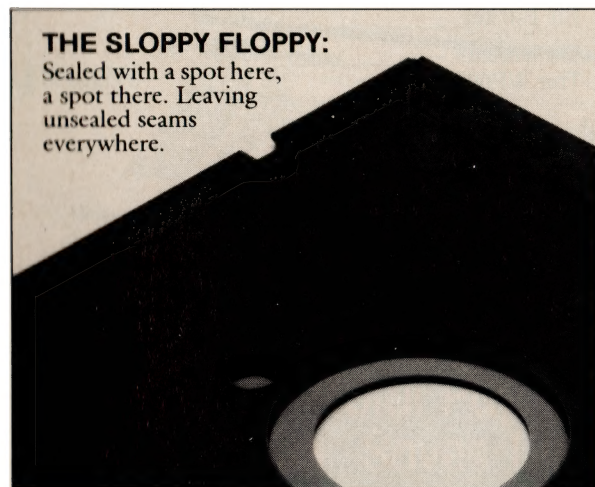
Most companies seal their discs with a spot here, a spot there. Leaving most of each seam not sealed at all.

Sooner or later, the seams might do what comes naturally: they bulge. Warp. Pucker. Open up.

Pens, pencils, fingernails—even a four-year-old's, like Herbie—can catch and snag in those wide open spaces.

That's sloppy. And dangerous. Because if you put a sloppy floppy into your disc drive, it can jam your drive. Ruin your drive head. Lose your data.

So much for their seams. Ours are different.



THE SLOPPY FLOPPY:

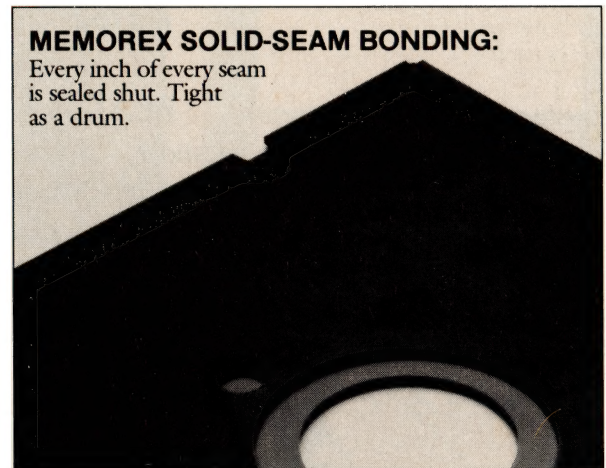
Sealed with a spot here, a spot there. Leaving unsealed seams everywhere.

Memorex uses a process we developed, called Solid-Seam Bonding.

Solid-Seam Bonding seals shut every inch of every seam of every Memorex® floppy disc. Tight as a drum. That makes the Memorex

floppy stiffer. Stronger. And your data safer.

To resist bulging, warping, puckering, or opening up.



MEMOREX SOLID-SEAM BONDING:

Every inch of every seam is sealed shut. Tight as a drum.

To resist all the things that can jam your drive, ruin your drive head, or lose your data.

Which proves that a Memorex floppy disc isn't equal to all the others. It's better.

Solid-Seam Bonding is just one example of the extra care that goes into every Memorex floppy disc. Be it 8", 5¼" or the new 3½". Extra care that lets us guarantee every Memorex disc to be 100% error-free.

The next time you're buying a floppy disc—or a few hundred of them—just remember this:

It's always better to be safe than sloppy.

For more information on the full line of Memorex quality computer media products, including computer tape, call Sydney (02) 908 2211 or Melbourne (03) 267 2955



Your Data. When it matters, make it Memorex.™

MEMOREX

CONTENTS



NEWS 8

FEATURES 19

Communications — A Baudy Tale	19
Bulletin Board Backchat	28
Gosh!	35
The Enigmatic Tulpi Modem	44
What's in the Packet?	51

REVIEWS 57

The Great Database	58	Enable — Part 2	83
Search: R:Base 4000		Assure — For	86
The Omni Reader	63	Insurance Agents	
Microsoft BASIC vs	68	Bit Bucket	92
MacPascal		Oh Brother —	94
Son of Zardax	72	The WP600	
Toshiba's 1500	75		

BUSINESS 97

If the Chemistry is Right ...	98
Viatel Grapevine	102

POCKET PROGRAMS 105

INSTRUCTION SET 111

PCs in Marketing, Part 3	112
Structured Programming, Part 7	118

PUBLIC DOMAIN 121

Lotus Hotline	123	Your Bee	142
New Products	126	Your C64	144
Your Bondwell	133	Books in Brief	145
IBM Underground	134	'Bit by Bit'	146
Your Appletosh	136	Clubfile	149
Your IBM	138	Glossary	156
Readers' Classifieds	140	Ad Index and Services	160
Your BBC	141	Next Month	162

THE MAINFRAME PAYROLL SYSTEM FOR YOUR IBM PC



INCREASED
PRODUCTIVITY

TRAINING

TOTAL FLEXIBILITY

TOTAL CONTROL

ON-GOING DEVELOPMENT

COMMUNICATIONS

MAINFRAME POWER AND FLEXIBILITY AT A MICRO COST

- Total Payroll Administration
- Saves Time and Money

TAILORED TO YOUR REQUIREMENTS

- Easy to operate
- Fully Supported
- Information Security

paywell

THE MICRO-COMPUTER PAYROLL SYSTEM THAT PAYS FOR ITSELF

TNT PAYROLL
MANAGEMENT
SYSTEMS

SYDNEY 698 8899
MELBOURNE 267 8222
BRISBANE 831 3122
ADELAIDE 333 2199
PERTH 322 4400



Authorised Dealer
IBM
Personal
Computer



Keeping Our Noses Clean

The frenetic activity surrounding publishers of computer magazines these days has prompted me to offer a few thoughts on what's been happening. Before commenting, however, I ought to point out I don't actually work at *Your Computer*; I consult to the publishers and haven't even seen the office for six months or more.

The more time I spend on the consulting side of my business the happier I am. Frankly, I don't really like to be associated with the low professional and ethical standards becoming evident in computer magazine publishing.

It's interesting how many magazines promote and publicise the latest products and the newest technology, while at YC we seem to have become increasingly sceptical. This is because those magazines, particularly their staffs, have no investment in the technology and nothing to lose. Their advice costs them nothing, and if the readers buy their recommendations then discover real problems — well, it's not the magazine's problem. The journalists can simply return their borrowed machines and try the latest models.

At *Les Bell and Associates*, we have a large investment in hardware and software, such as the IBM PC, the Lisa, the Compupro and other machines, while YC has multiple Compupros, Olivettis and all kinds of hardware. We found even after reading the reviews and selecting exactly the right products there's a lot of work to do before everything works right. That's what YC is about.

Because there are deficiencies in other publications' abilities to properly support their readers, let alone themselves, after they've bought their computers, it would pay readers (and advertisers) to ask where the publishers' interests lie. With so many publications in an overcrowded market, there's a lot of wheeling and dealing going on.

Circulation is the supposed 'name of the game': a higher circulation enables magazines to get more advertising and charge more for it. However, at least one magazine has been

attempting to boost a flagging circulation by sending free copies to owners of brand X machines who didn't request it and may not even bother reading it. These copies are actually paid for by the manufacturer of brand X, who naturally expects (and gets) disproportionate coverage in the magazine.

The same magazine will not respond to requests for cancellation of subscriptions; they simply keep sending the magazine regardless. Advertisers must ask themselves whether all the claimed readers are actually reading the magazine and seeing their advertisements.

Other magazines are simply free to whoever wants them — but remember, there's no such thing as a free lunch. These magazines are paid for by the advertisers, and the publishers therefore have a vested interest in promoting the advertisers' products. With one magazine (sold on news-stands and by subscription) actually directly paid for by two major advertisers, readers must ask themselves what is unbiased editorial and what is disguised advertising. The other advertisers should ask themselves if they are getting a fair shake.

A brawl between two publishers in the letters column of the advertising trade journal *AdNews* has done nothing to enhance their professional images. While each accuses the other of falsifying circulation figures, or at least, being very selective about the truths they tell, they have simply revealed that neither understands the nature of magazine readership research.

Recently, the Advertising Standards Council upheld complaints by two of the industry weeklies that the advertising placed by a newcomer was in breach of the Advertising Code of Ethics.

As an independent consultant and author, the major asset I possess is my credibility. It's important to me to remain unbiased and free of any pressure, and important for professional success that this should be seen to be so. I feel confident that the same can be said for *Your Computer*'s publishers and the other contributors and reviewers. I wish it could be said for other magazines.

LES BELL

EDITOR

Natalie Filatoff

CONSULTING EDITOR

Les Bell

NEWS EDITOR

Rose Vines

SUB-EDITOR

Kate Storey

ART & DESIGN

Mark Elder

ADVERTISING PRODUCTION

Danny Hooper

MANAGING EDITOR

Matt Whelan

PUBLISHER

Michael Hannan

CONTRIBUTORS

Australia: Brendan Akhurst, Bill Bolton, Annette Brown, Darren Challis, Andrew Farrell, Phil Grouse, John Hepworth, Norman Kemp, Frank Lee, Peter Lynden, Bruce Mitchell, John Nicholls, Jeff Richards, Rod Stevenson, Dom Swinkels, Colin Tringham.

United States: Howard Karten

OFFICE SERVICES

Felicity Skinner

SUBSCRIPTION ENQUIRIES

Julie Plummer

ADVERTISING SALES

Damien Prins, Andrea Beaty (NSW Advertising)

David Farrington (Victorian Advertising)

OFFICES

NSW

140 Joynton Ave, Waterloo 2017.

(02) 663-9999

Telex: FEDPUB AA74488

Victoria

150 Lonsdale St, Melbourne 3000.

(03) 662-1222

Telex: FEDPUB AA34340

Western Australia

Tony Allen and Ass.

7 Fore Street, Perth 6000.

(09) 328 9833 Telex: AA94382 POSPE

Queensland

John Perry, Federal Publishing, 25

Balaclava St, Woolloongabba 4102;

(07) 391 8922. Telex AA145520.

South Australia

Steve Birbeck, Admedia Group,

24 Kensington Rd, Rose Park 5067.

(08) 332-8144

New Zealand

Chris Horsley, 4A Symonds Court,

Symonds St, Auckland, NZ.

Telex: TEXTURE 260753

Source Mail: Les Bell TCY314;

Matt Whelan TCY267.

Bulletin Board:

(02) 662-1686 — Les Bell 1085, Matt Whelan 1, or leave a message in comments.

YOUR COMPUTER is published monthly by the Federal Publishing Company Pty Ltd. Printed by ESN - The Litho Centre, Waterloo 2017, phone (02) 662-8888.

Editorial and NSW Advertising:

Spit Junction Avenue, Waterloo 2017.

Telex: FEDPUB AA74488.

Typeset by Frontier Technology, Spit Junction NSW; phone (02) 960-2788.

Distributed nationally by Gordon & Gotch. Registered for posting as a publication — Publication No. NBP4384. See 'Public Domain' section for information on copyright, contributions, reader services and subscriptions.

*Recommended and maximum price

When was the last time a wordprocessor helped you prepare your invoices?

Type in the
customers name.
His address and the
delivery instructions will
be automatically inserted.
Provide quantity,
description and price,
and the total for the
line is automatically
(calculated).

Invoice number
inserted
automatically

Today's date
inserted
automatically

Consolidated Manufacturing
38 BEDLAM ST, BLACKTOWN, 7318.

CM

INVOICE
500

Attention: Mark Hassler
Australiawide Distributors
384 Clarence Street
Sydney 2000

DELIVER TO
Wal Wrekit
28 O'Royden Street
Alexandria 2048

QUANTITY	DESCRIPTION	UNIT	PRICE	TOTAL
60	Storage Container	45	2.85	128.25
220	Paper Rolls	160	1.48	325.60
80	Plastic Holder	65	3.14	251.20
500	Mounting Clips	400	.06	24.00
10	Steel Side Fittings	10	78.40	784.00
200	Snap-in panelling	150	6.74	1011.00
Subtotal				2388.15
Tax (22.5%)				537.33
Freight				120.00
INVOICE TOTAL				3045.48

Spellbinder then
automatically
calculates the
total and adds
on tax and
shipping
charges.

A new blank invoice
then appears.

INVOICE (Attention: Mark Hassler) Wal Wrekit
384 Clarence St Sydney 2000 28 O'Royden Street
Alexandria 2048

DESPATCHED PER: 11234 ORDER NO: 1112 SALES TAX NO: 5 TERMS: 7 DAYS NET INV. DATE: 6/6/87

ITEM	DESCRIPTION	QUANTITY	UNIT	PRICE	TOTAL
11	Storage Container	60	45	2.85	128.25
12	Paper Rolls	220	160	1.48	325.60
13	Plastic Holder	80	65	3.14	251.20
14	Mounting Clips	500	400	.06	24.00
15	Steel Side Fittings	10	10	78.40	784.00
16	Snap-in Panelling	200	150	6.74	1011.00
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					
41					
42					
43					
44					
45					
46					
47					
48					
49					
50					
51					
52					
53					
54					
55					
56					
57					
58					
59					
60					
61					
62					
63					
64					
65					
66					
67					
68					
69					
70					
71					
72					
73					
74					
75					
76					
77					
78					
79					
80					
81					
82					
83					
84					
85					
86					
87					
88					
89					
90					
91					
92					
93					
94					
95					
96					
97					
98					
99					
100					

TOTAL \$ 2388.15
TAX \$ 537.33
SHIPPING \$ 120.00
INVOICE TOTAL \$ 3045.48



Helping you prepare invoices is just one way Spellbinder wordprocessor and office management system can be speeding paperwork through your office. Spellbinder is the most talented and easiest to use CP/M wordprocessing system. Facilities which the others sell as extras, like mailmerging and sorting are standard features on Spellbinder. And because they are fully integrated they're quicker and easier to use. And that's just the start. Spellbinder comes complete with a series of powerful built-in application programs which are easily tailored to perform office tasks like invoicing, reports and calculations.

When you want help in the office - whether it involves words, numbers or both - there is very likely a Spellbinder application that can be helping out.

For further information on Spellbinder and the name of your nearest Spellbinder dealer, call Software Source now on (02) 389 6388

Spellbinder™
Exclusive Australasian Distributor:
Software Source Pty Ltd.
PO Box 311, Bondi Junction

TAB CHOOSES A CHEAPIE

Punters in outback Western Australia will soon be able to lose as much as their city counterparts, thanks to a \$500 Commodore computer.

The TAB in WA is in the process of installing modern betting facilities in some of the most remote parts of the state, with a computerised betting service linked to Telecom's Austpac service. Austpac provides STD facilities for the cost of a local call and time used on the system.

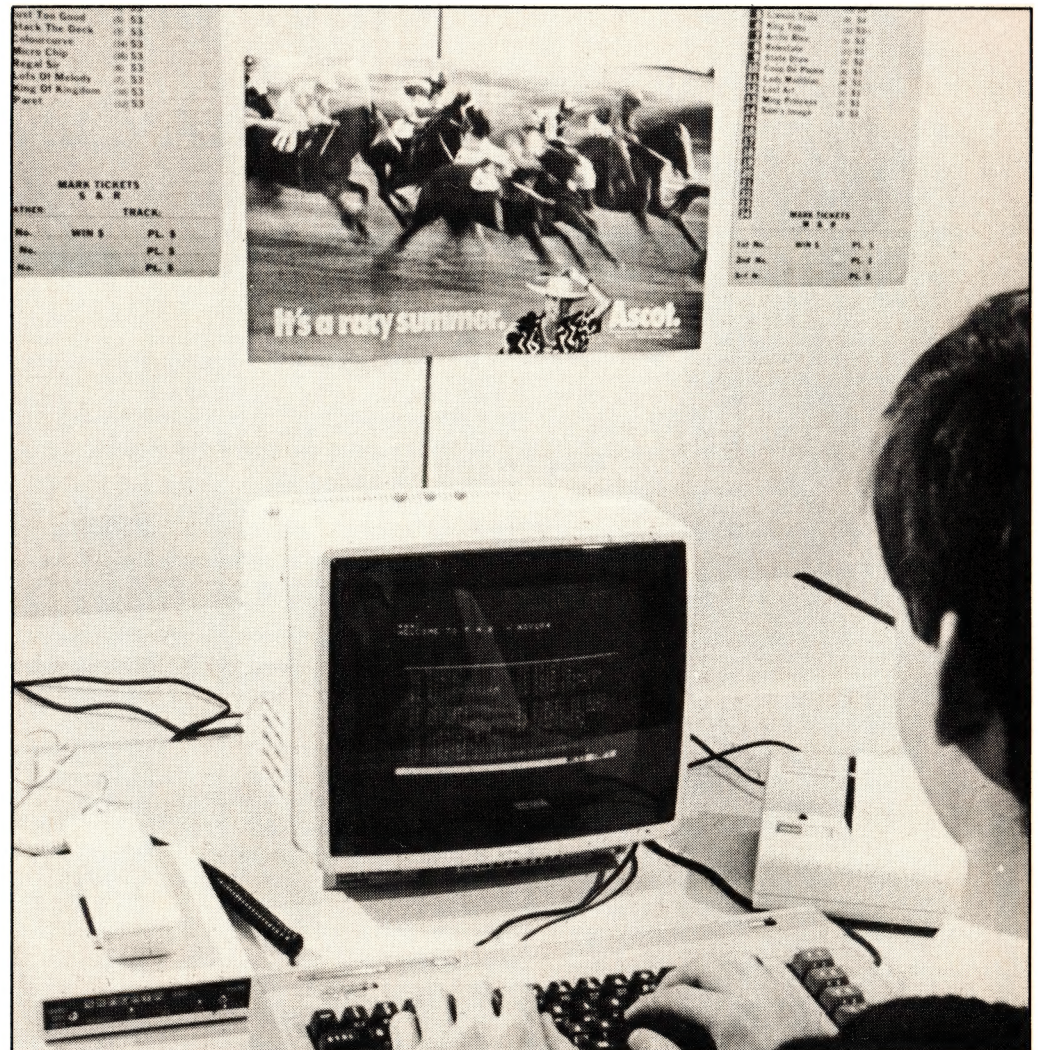
A TAB team led by Computer Services Manager Richard Brisbane-Cohen took less than six months to initiate a service utilising Austpac, a Commodore 64 keyboard, a small thermal printer, an inexpensive VDU and a modem.

According to Mr Brisbane-Cohen, the team was after off-the-shelf equipment which was robust and easy to maintain. "The most common and least expensive terminal was the Commodore 64, which was compatible with our requirements and enjoyed the added advantage of being easy to program."

TAB staff developed the required software in BASIC and Assembler and the program was burnt into a game cartridge. The first location to receive the new TAB service was the mining town of Leinster in the Eastern Goldfields. A sub-agency service now operates from a de-licensed area of the town's 'wet' canteen under the direction of canteen personnel, who were trained by TAB staff. The facility is programmed to give Leinster punters the full range of TAB services.

The TAB hopes to establish sub-agencies in the next six months at outlets such as newsagents, video shops and hotels in locations which may include Panawonica, Denham, Ravensthorpe, Hopetoun, Lake Grace, Shay Gap and Argyle diamond mine.

TAB staff believe the life of the technology employed in the new system will be about three years. Although the system is streets ahead of the telex method which has been employed in remote



areas since 1976, there are some limiting factors, such as the speed of entry of bets, which now averages around three per minute, compared with 12 in country agencies and 50 at city locations. □

COMPUTER SKILLS FOR THE UNEMPLOYED

A new computer training course, designed to give 18 young people a chance to learn computer operations and other office skills, has been launched in Matraville, a suburb of Sydney.

The course is being funded by a grant of \$46,949 from the Federal

Department of Employment and Industrial Relations under its Experimental Training Projects Program, and sponsored by Peninsula Community Services. The first session is underway, with a second already scheduled.

The training project is called Compuskill, and to be eligible to participate trainees must be between 18 and 24 years old, able to touch-type at 20 words per minute, and have been unemployed for at least four months.

At the end of the course, Compuskill staff will advise students on deciding what kind of work they would like to do and will also provide practical assistance in finding suitable positions. Students who have completed previous courses have had a high level of success in gaining em-

ployment.

As the course progresses, students will learn word processing, basic computer programming and electronics and other general, employment-related office skills including receptionist duties, filing and bookkeeping.

Project manager for the course, Meg Rigby, said emphasis would be placed on encouraging students to develop additional personal skills through participating in group sessions, and by using films and videos featuring office, job-search and occupational health skills. Communication and confidence-building techniques will also be taught.

"The main object of the program is to train disadvantaged young people to a standard acceptable to commercial firms ▶

COMPUShACK

has gone

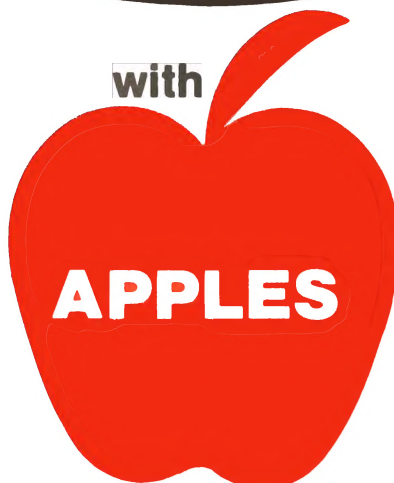


SAVE\$

BANANAS

SAVE\$

with



Free Software

Free CPM + Z-80

Remember the IIc Family Pack — It's back at CompuShack

IIc

Monitor
Stand
Joy Stick
Word Handler
Chess
1 Game

\$1995

IIe

Duodisk
Extended 80 card
Monitor IIe
Accessory Kit
Wordstar Starcard
CPM, Z-80, 6.5 MHz

\$2995

Mac Jazz Pack

Macintosh
15" Imagewriter Printer
Accessory Kit
2nd Disk Drive
Lotus Jazz — included FREE

\$5895

APPLE ACCESSORIES

for IIc

Appleworks	\$259
Dollars & Sense	\$139
Flight Simulator	\$69
Parallel Printer Interface	\$149
Second Disk Drive	\$350

for IIe

Wordstar Starcard	\$225
Extended 80 Col Card	\$150
5 Pack S/W	\$50
Flight Simulator	\$69
Second Disk Drive	\$345

for Mac

Microsoft Basic	\$229
Microsoft Multiplan	\$289
Microsoft Chart	\$189
3½" Disks (10)	\$69
Mousepad	\$28

Ask about the Scribe printer special offer

DX-100N 5¼"
disk storage box

\$27

Le Aussie diskettes (10)

\$24

Carrying Case

\$99

Only at:

COMPUSHACK

Authorised Apple Dealer

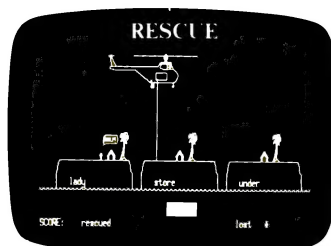
1/303 Pacific Highway,
Lindfield. (02) 467 1933

While Stocks Last

The great new offer from microbee

The Full Story

Microbee, the ideal Education and Home/Business Computer is solving problems every day. Now microbee has solved another problem, the 'COMPUTER-IN-A-BOOK' is now a Computer in a package. Read on and find out how you can have a whole ready to go computer package for one incredible price.



THE INTERFACE OF TECHNOLOGY AND EDUCATION

The 3.5 Inch Disk

The COMPUTER-IN-A-BOOK has the perfect low cost, highly reliable, disk drive system that enables expansion to meet your changing needs. It's also available with several options, but most of all, it's an economical way of achieving Disk Drive capability. Featuring, an economical 3.5 inch 400K high speed/high density drive which is very compact and expandable to two drives.

The Offer

This great package offer boasts all of the following equipment:

- 64K microbee.
- 3.5 Inch Disk Drive.
- Monitor in either Amber or Green Screen.
- Full Documentation including a Manual in a binder which details all user requirements and operation.
- In addition to the manual, an exciting Demonstration Disk 'Bee Primer' is included.

'Computer-In-A-Book' also features:

- Microworld Basic (Basic Language).
- Word Bee (Word Processing Software).
- CP/M (Operating System).
- Disk Catalogue — Keep a record of all your disks with this easy reference diskette.

The Packaged Software

The 'COMPUTER-IN-A-BOOK' package offer doesn't stop yet. For NO extra cost you have the choice of one of these four great software packages:

The Games Package — Arcade Games Vol. 1 and Family Games Vol. 1 which consists of two disks, valued at \$59.00 — Yours FREE!

Arcade Games Volume 1

- Robot Man
- Scrambler
- Viper
- Eureka
- Target
- Destroyer
- Hustle

Family Games

- Australian Economy
- Concentration
- Chess
- Draughts Plus

OR

The Primary Education Package which consists of 'Learning Can Bee Fun With Words' and 'Learning Can Bee Fun With Numbers'. Also valued at \$59.00 — Yours FREE!

Learning Can Bee Fun With Words

- Rescue
- Frog Opposites
- Spelling Wars
- Alpha Sort
- Land of Lex
- Spelling Wars 2
- Alpha Sort 2
- Land of Lex 2

Learning Can Bee Fun With Numbers

- Maths Muncher
- AC Math
- Add Star
- Gorilla Maths
- T.N.T.
- Fraction Race
- Maths Race
- Square Targets
- Number Mine

OR

The Secondary Education Package which consists of 'Bee Scientist' and 'Social Studies', valued at \$59.00 — Yours FREE!

Bee Scientist

- Intro to Millikans
- Millikans Experiment
- Kepper's Law
- Coulomb's Law
- Chemical Compounds
- Valency
- Elements and Symbols
- Vector Tutorial
- I J Vectors

Social Studies

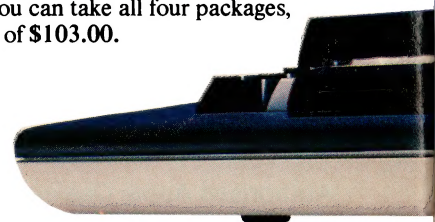
- Geograbee
- Histribee
- Aussiebee

OR

The Home Office Package which contains Business Graphic and Simply DB - Database on 2 Diskettes. Valued at \$59.00 — Yours FREE!

ALL THIS FOR JUST \$995

Finally, The Software Super Offer — for just an additional \$133.00 you can take all four packages, representing a saving of \$103.00.



The Right Options

Unlike other computers where you need to buy further equipment such as Disk Drive, maybe even an interface to link to the drive, microbee has it all — built in.

But, microbee is not without its exciting options. Extras include Bee Modem. Connect your Bee with the rest of the world with this Telecom approved Modem that will convert your microbee into a Videotext Terminal. PRICED AT \$189.50.

The Viatel Option at \$49.50 used in conjunction with the Bee Modem, will bring the world to you. Viatel puts you in touch with what's happening — News, Weather, Stock Market, Tele Banking Information and the new microbee service.

The DP100 Dot Matrix Printer is another microbee option at just \$399.00.

The swivel base adjusts for ease of use at just \$24.50.

The Package

**For this Fabulous
All Inclusive Computer Package
JUST \$995.00**



microbee computer

Designed and manufactured
in Australia by
Applied Technology

PHONE ORDERS  ACCEPTED

microbee technology centres

N.S.W.

1 Pattison Ave, Waitara 2077

Phone (02) 487 2711

2/956 Hunter St,

Newcastle West 2302

Phone: (049) 61 1090

VIC.

50-52 Whitehorse Rd, Deepdene 3103

Phone (03) 817 1371

W.A.

141 Stirling H'way, Nedlands 6009

Phone (09) 386 8289

S.A.

117-119 Gouger St, Adelaide 5000

Phone (08) 212 3299

QLD.

455 Logan Rd, Stones Corner 4120

Phone (07) 394 3688

FACTORY

Koala Crescent, West Gosford 2250

Phone (043) 24 2711

microbee education
technology centre

Unit 2, Eden Park Industrial Estate

31 Waterloo Rd, North Ryde 2113

Phone (02) 888 9866

N.Z.

438B Rosebank Rd, Avondale,
Auckland 7.

Phone (09) 88 1138/88 1139



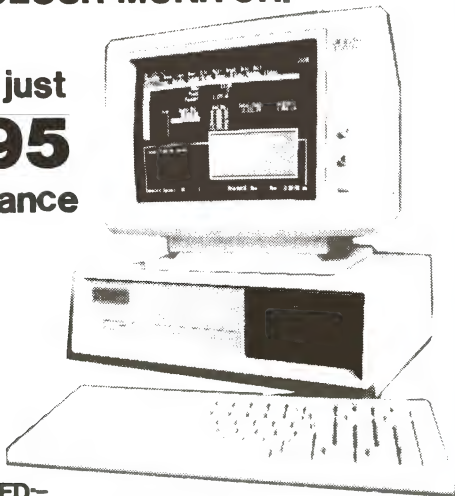
Swivel Base Extra

\$500 TRADE IN OFFER!

the Computer Spot

**OFFERS YOU AT LEAST \$500
FOR YOUR OLD COMPUTER,
CALCULATOR OR GAMES MACHINE,
WHEN YOU TRADE UP TO
THE SIGMA ELITE XT PLUS,
WITH 10meg.HARD DISK DRIVE
& COLOUR MONITOR.**

You pay just
\$4495
plus allowance



ALSO INCLUDED:-

Two floppy disk drives, 256K RAM
MS DOS CONCURRENT CPM.

**FULL SIGMA BACK-UP SERVICE &
WARRANTY CONDITIONS APPLY**

the Computer Spot

SYDNEY
M.L.C. CENTRE,
TEL: 235-2971

PARRAMATTA
GREENWAY ARCADE
222 CHURCH STREET
TEL: 635-6020

IBM RESEARCHES PARALLEL PROCESSING

IBM's Research Division is designing a research tool for advanced computer science studies — an experimental 'highly parallel' computer.

The initial purpose is to gauge the usefulness of large-scale parallelism — many processors working on a single task — in solving a variety of complex problems. At present, most highly parallel machines work on a single class of problem.

The machine — the RP3, or Research Parallel Processor Project — is to use operating system software designed and written by a group at New York University's Courant Institute of Mathematical Sciences.

The initial version of the RP3 is being designed as a processor unit to validate the concept and to test its ability to do a variety of tasks. By interconnecting eight of the 64-processor units, RP3 will be extensible to 512 processors, linked in parallel and connected to as many as two billion characters of main memory.

The 512-processor version of the RP3 should operate at a sustained speed of approximately one billion instructions per second in its maximum configuration and perform certain mathematical calculations — called floating-point operations — in bursts of 800 million per second.

Challenges to parallel processing

The RP3 is intended to explore the application of parallel processing to computer-aided design, so-called 'expert systems' and advanced artificial intelligence projects, in areas such as visual perception.

The basic ideas behind parallel processing are simple: divide applications into many small sections and solve them simultaneously. Two processors will work twice as fast as one, three will triple the speed, and so on. In addition, such an approach could have important benefits for system reliability and availability.

However, while parallel processing carries significant promise, the field is very much in its infancy and several basic issues have to be resolved. Two of these issues are obvious: one is the nature of the computational problems, and the other comes from the proposed solution.

First, not all problems can be conveniently fragmented, solved in parallel and re-assembled. Some are inherently serial, and must be solved as a series of steps, or contain small serial portions that will seriously impair parallel performance. For example, a five per cent serial portion in an application will limit the computing speed up to 20 times — no matter how many processors are used.

This means some applications will never be practical candidates for parallel processing, although it is not immediately obvious which problems are inherently serial. Studies on how to partition programs for parallel computation, and understanding the performance that can be delivered by a given computer architecture over a range of applications, thus become of critical importance.

The second issue is a 'traffic' problem springing from the nature of parallelism. As a large number of processors engage in a task, simultaneous attempts to fetch data can quickly create a kind of tie-up that nullifies the anticipated speed advantage of multiple processors.

The RP3 continues parallel processing research that began at IBM in 1979. This work has produced special-purpose parallel machines used within IBM for basic research and for computer design automation. The current work is an extension of collaboration between the IBM Thomas J Watson Research Centre in Yorktown Heights, New York, and groups in several academic institutions, most significantly the 'Ultracomputer' Project at New York University. It is one of several current IBM projects aimed at understanding computing systems with a number of processors connected in parallel.

IBM hopes to share the RP3 with qualified academic and government users, and is therefore seeking partial government funding for the construction of a hardware prototype. □

for employment," said Ms Rigby. "To achieve this, students will be given work experience in commercial settings, both within the Compuskill centre and in outside business placements."

All recruitment for the course will be handled by the Maroubra Junction CES. □

NOTATION IN NANOSECONDS

Oxford University will soon release its Oxford Music Processor (OMP), a computer program likely to revolutionise the way in which musical notation is prepared for printing. It will enable the music publishing industry and musicians of all kinds to provide themselves easily with musical notation of the highest standard.

OMP carries out almost all the tasks which have traditionally required painstaking and slow manual arrangement of musical notation on the page. With this program, the computer takes all the various rules of notation design into consideration, and is claimed to produce a finished product within a tenth of the time required by traditional methods.

Richard Vendome, of the university's Faculty of Music, developed the program while working on his post graduate thesis. "My thesis presented the enormous task of transcribing 400 keyboard works from 17th Century manuscripts into modern notation. Over the course of several years, I developed software for the encoding, editing and printing of this music."

Vendome's main goal was to assemble the music in a publishable form and to combine speed of input and quality of output. So far, nearly ten thousand pages of music have been processed, many of which have now been published.

According to Vendome, music can be keyed into the computer very easily, and the system has been successfully used by musicians with no knowledge of computing and by young children. The essentials can be learnt in one hour, with rhythm and pitch being input in separate passes through a standard computer keyboard. A four-part score would be input by

eight successive 'sweeps', each at roughly the speed it would take to play the music. As Vendome puts it: "The Minute Waltz might take more than eight minutes to process, while traditional methods would take hours."

Best news about the system is that it is currently being developed to run on home computers. With funds from the British Technology Group and support from Oxford University Press, Vendome has been awarded a three-year research appointment to develop the system for personal computers. At the same time, he is adding other facilities, such as word underlay, and exploring the possibility of using laser printers.

The program will be published by Oxford University Press in 1986, in the form of a case-bound user's guide and reference manual, with a suite of programs on floppy disk. □

IBM EMPLOYEES DIE IN CRASH

Philip D Estridge, vice-president for IBM PC manufacturing in the US, was one of those killed in the recent major air crash at Dallas. Estridge's wife, Mary Ann, and about 18 other IBM employees also died in the crash.

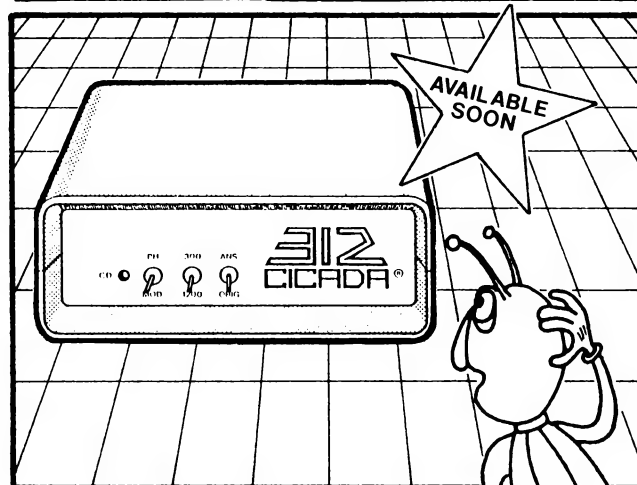
Estridge was a major force in developing the IBM PC as the market leader for 16-bit microcomputers. He visited Australia twice, once in 1983 when he was guest speaker at the NSW branch conference of the Australian Computer Society, and again in 1984 when he assisted in setting up the IBM Australia PC manufacturing plant at Wangaratta. □

SMASHING SOFTWARE

The National Roads and Motorists' Association (NRMA) has released to the public a new computer system which caters specifically to the demands of the smash repair trade. Called Microquote and Microquote Busi-

NEW MODEL!

**THE PRICE/PERFORMANCE
WINNER**



**312
CICADA®**

The new VIATEL-MODEM with all the legendary Performance and Reliability of the CICADA 300 series. Fully Telecom approved. Approval No.C85/3037/1358



®CICADA is the registered Trade Name of CENTRE INDUSTRIES

CENTRE INDUSTRIES
**ELECTRONICS &
TELECOMMUNICATIONS
EXPERTISE**

187 Allambie Road, Allambie Heights, NSW 2100
Telephone (02) 451 5555 After Hours (02) 451 6244
Telex AA 22671

Sole Australian Distributor:
R.F. COMPUTER COMMUNICATION PTY. LTD.
Suite 30, 456 St. Kilda Road,
Melbourne, VIC.
Phone (03)2671011

ness Manager, the system was developed from the NRMA's existing Compuquote software.

According to early users of the system, Microquote saves time on quoting, gives instant job calculations and provides professional-looking quotes — as one user said, "particularly important for an industry lacking a highly credible image."

Microquote also handles job costing and control of work flow. Graham Hart of Windsor Motors, who has used the system, reported: "It is often hard to keep an even flow of work and ensure you're making as much as possible when you're busy. Microquote gives you an accurate picture of work being done for each job, how much you've made on each job and the efficiency of each area of work."

Working in conjunction with the Microquote system is the Microquote Business Manager. This is a cash management system which controls all debtor and creditor procedures and provides instant cash analysis.

The NRMA has joined forces

with Intelligence Australia to supply and install the hardware and provide the training and support for the system. More information can be obtained from Maria Nash at Compuquote, (02) 260 9251. □

QUEENSLAND COMPUTER EXPO

The focus for computer shows moves north in November, with Computer Expo '85 to be held at the Crest International Hotel in Brisbane.

Now in its third year, the Expo attracts exhibitors from all parts of Australia. Companies displaying their goodies this year will include Apple, IBM, Hewlett-Packard, Wang, Data General, NEC, Televideo, Epson, Ericsson, Tandy, Commodore and Microbee.

According to the organiser, Robert Woodland, the timing of the Expo has been perfect, as new products released at the Pan Pacific Computer Exhibition in Melbourne will be brought up for

display at the Expo. This will be the best chance in the year for Queenslanders to get a close look at a large range of the latest software and hardware.

The show is not only geared

towards the business community, but also features a huge range of equipment for education, home and hobby use.

For more information contact Robert Woodland, (07) 372 3233.

THE IMPERSONAL TOUCH

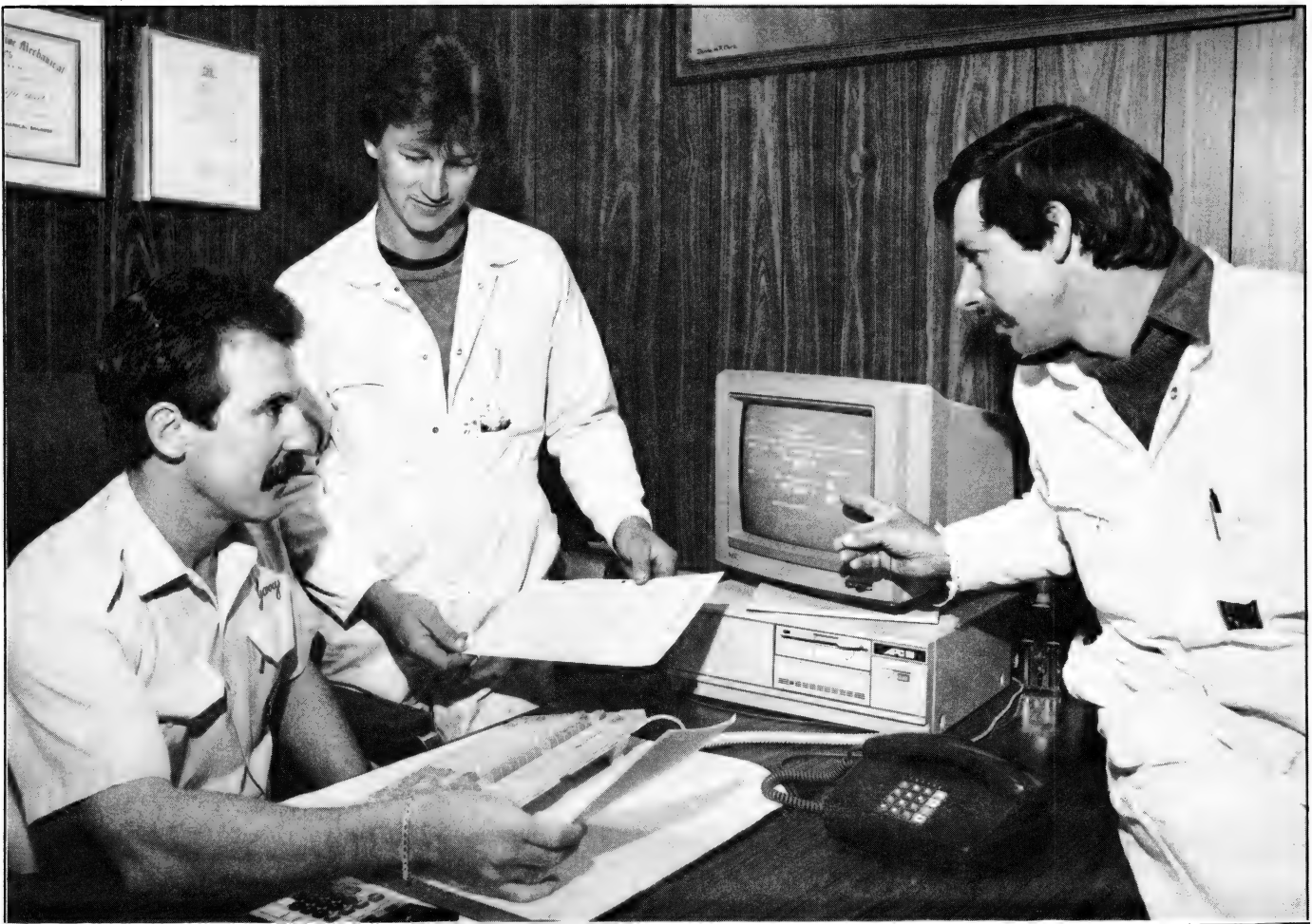
A West Coast US company, Autocomm Corporation, has developed a 'computerised calling system' which will automate repetitive telephone calls. The Autocomm Messenger uses the Texas Instruments' Professional Computer and TI's Speech Command System as the basis for the system.

This friendly little package automatically dials a list of telephone numbers, plays a recorded message and records a response. Ideal, so the press release goes, for schools wishing to report to parents on problems such as absenteeism or failing grades, or for your

bank to inform you you've hit the red.

In fact, it sounds indispensable for any business or organisation wanting to make its clients feel like numbers. Numerous uses spring to mind: replying to unsuccessful job applicants; letting welfare recipients know they've had their benefits cut; or any instance when *personal* contact might involve emotions or time-wasting explanations.

The Messenger will handle 40 difficult customers per hour and can sort recipients into seven categories for specially impersonalised messages. When finished with its hit list, it will function as a normal TI Professional Computer. Just the sort of product to make personal computers universally beloved. □



MORE XTRAS

After restricting sales of its ITT Xtra Personal Computer to selected corporate clients, telecommunications giant STC has now decided to offer the machine to the general public.

STC's decision to tackle the PC area represents a significant shift in its marketing emphasis. The company is arming itself with products it claims will make it a force in the crowded personal computer market. At the same time, the National Sales Manager of STC's new Personal Computer Division, Hilton Gray, says his organisation is throwing down a challenge to the PC industry leader, IBM.

"STC is positioning itself to compete head-on with IBM for personal computer sales. We're now releasing the ITT Xtra to the public, and a more powerful model, the ITT Xtra XP, will soon arrive in Australia. Both personal computers are completely compatible with IBM PCs; however, our XP is 3.5 times faster than the standard

IBM PC."

Hilton Gray believes a key to STC's drive into the marketplace will be QNX, a multi-user, multi-tasking operating system incorporating local area network support, which allows STC's PCs, IBM PCs, ATs and compatibles to support ten terminals. "We believe QNX is the only operating system in Australia, or indeed the world, to offer so many advanced features. No other PC operating system has such sophisticated multi-user capabilities."

STC will use its existing service network to support its computer products, and Gray believes this network, combined with the company's established name, will attract a good share of the business community's PC dollars. □

PROPHET GAINS A UNIVERSE

AED has donated a Universe Supercomputer to the Prophet Bulletin Board; the new computer will be used as the basis of a mul-

ti-access system. Larry Lewis, system operator of Prophet, hopes to have the multi-user system fully installed by the end of October.

To coincide with the introduction of the new hardware and software, a user group will be formed to allow better communication between the system users and operators and to enable users to meet in the flesh.

Prophet's number is (02) 628 7030 and sysop Larry Lewis can be contacted at PO Box A497, Sydney South 2000. □

SYNERGISTIC BEER DRINKING

Don't forget *Your Computer's synergistic beer drinking* on the first Wednesday of each month. The last couple have been lively affairs, and we expect the spring weather will encourage some new faces to come along and partake of the badinage and beverages.

The venue is the Clock Hotel, 470 Crown Street, Surry Hills, Sydney, and we attempt to get there around 6 pm. Come along and let us know how we can make the magazine better for you. □

AIIA TASKFORCE TO STAMP OUT RSI

Following hot on the heels of government enquiries into the incidence of repetition strain injury (RSI), the Australian Information Industry Association has come up with a package to educate and train managers on health and safety aspects of computer-based equipment in the workplace.

For a neat \$500, managers can obtain training and a kit, which consists of a lesson plan, a booklet entitled *Introducing Computer-based Equipment into the Workplace*, visual material and background papers. Areas covered in the booklet include vision, radiation and musculo-skeletal disorders, design of jobs and employer/employee relationships.

The AIIA, which comprises 60 companies, claims its efforts are directed at the prevention of problems, and is looking at spon-

soring a more thorough study of RSI in the near future.

Further news on the RSI front is the release of an interim report on RSI by the RSI Committee of the National Occupational Health and Safety Commission.

Some of the report's findings are:

- RSI is not an Australian disease, nor is it new; there is irrefutable evidence for its existence in other developed countries, and the history of RSI goes back several hundred years.
 - The variety of terms used overseas to describe RSI has probably contributed to the belief that it is a peculiarly Australian condition, when it is actually widely recognised internationally under names such as occupational cervico-brachial disorder or musculo-skeletal injury.
 - While most recent publicity on RSI has concerned female keyboard workers, the condition has in fact been widespread among both men and women in many occupations and activities. Occupations cited in the report include process workers, shearers, musicians, hairdressers, telegraphists and cash register operators.
 - RSI is *preventable*, and there is a large body of knowledge in the fields of ergonomics and work environment studies that can and should be productively applied.
- The report found current occupational health services generally inadequate, particularly in small firms. □

NO DEAD-END FOR VIC

Despite the commercial demise of the Commodore VIC-20 computer, there is still a large number of enthusiastic users remaining who have no intention of disposing of their machines. To support this group, the ACT VIC-20 Users' Association has committed itself to continuing to produce its bi-monthly magazine, *Vic*.

The magazine costs \$2 per issue and is full of articles entirely devoted to the VIC-20. The asso- ▶



ciation also distributes public domain software for a small copying fee, maintaining a library of around 900 programs. This service is open to non-members as well as members of the association.

Despite the end of association meetings, free advertising, software consulting and special deals on books, disks, tapes and hardware are still available to members.

If you have a VIC and need some support, drop the association a line. The contact is Chris

Groenhout, 25 Kerferd Street, Watson 2602; (062) 41 2316. □

WANG FUNDS DANCE FANTASIES

In one of the largest-ever arts world sponsorships in Australia, Wang Computer has pledged three quarters of a million dollars' support to the Sydney Dance Company.

The move makes Wang the principal sponsor and gives the

Dance Company a financial guarantee into 1988. The three-year sponsorship was announced by Graeme Murphy, the company's artistic director, before the first-night audience of *After Venice* at the Sydney Opera House. It flows on from continuous sponsorship Wang has given the company since August 1983.

The first direct effect of the new sponsorship will be the production of Murphy's most ambitious undertaking to date. Entitled *Boxes*, the work will be staged at the Sydney Opera Theatre from

November 7. Murphy will join forces with Iva Davies and Bob Kretschmer of Icehouse to produce a musical and dance spectacular.

Of the sponsorship Graeme Murphy says: "This is a one-in-a-million sponsorship with no strings attached, and will give us even greater freedom to explore our wildest fantasies of contemporary dance. Thanks to Wang we have not had to compromise over the past two years. Now we can plan ahead with the same sense of daring." □

AMERICAN GRAFFITI

BY HOWARD KARTEN

TEST FOR SHRINK-WRAP LAW

A good deal of American software — particularly the more expensive variety — comes with a simple 'licence agreement', usually inserted just beneath the plastic shrink-wrapping or on a sealed envelope enclosing the software. By unsealing the shrink-wrap or opening the envelope, buyers are assumed to tacitly accept the agreements, which have had few, if any, challenges in court.

Although some wags have alleged the law gives software purchasers the right to keep their own teeth and not much else, the provisions of the agreements are in fact fairly simple. One licence agreement, for example, states that the vendor retains ownership of the product. The Lotus 1-2-3 agreement doesn't explicitly make that statement, but, like most licence agreements, prohibits unauthorised duplication and/or telecommunication of the software and manual, or modifications, sublicensing or various other malfeasances.

Those licensing agreements have now come under attack in the state of Louisiana, and since both American and Australian law stem from British Common Law the outcome of the case could eventually have repercussions in Australia.

Americans think of Louisiana less as a high-tech haven and more as a festive location, best

known for the Mardi Gras, Creole food, and voodoo. However, the Louisiana Software Licensing Act is designed to put teeth into the licensing agreements. In the United States District Court in Louisiana, Vault Corporation of Westlake Village, California, is suing Quaid Software of the province of Ontario, Canada.

Vault makes a copy-protection scheme called Prolok. Quaid makes Copywrite, a cheekily-named utility for IBM PCs which allows users to copy 'protected' software. Copywrite is even said to be capable of copying software protected by Prolok. Vault alleges that to incorporate that feature Quaid must have disassembled or otherwise 'reverse engineered' Prolok — an action prohibited by the Louisiana law.

Attorneys for both sides, as well as throughout the industry, are watching the case closely in the belief that it's a test case which will set a significant precedent, regardless of the outcome. Additionally, several other American states are contemplating similar bills, although few states have actually enacted them.

IBM BUYS A PIECE OF MCI

MCI Communications Corporation of Washington DC is the upstart long-distance communications company which deserves most of the credit for unseating

AT&T as the sole provider of long-distance telephone services in the United States. IBM recently gave 60 per cent of its interest in Satellite Business Systems to MCI in exchange for ownership of 16 per cent of MCI. The agreement between MCI and IBM enables IBM to acquire a maximum of 30 per cent of MCI, which also operates a well-received nationwide electronic mail service.

IBM has recently been investing in a variety of firms in the telecommunication business. For a while it was an investor in the American firm Mitel, and more recently it completely purchased United States phone maker Rolm of California. The IBM-MCI combination is IBM's first venture with a voice communications carrier. However, IBM also operates several networks for internal customer use, such as its own nationwide voice communications system and the IBM Information Network, linking several different large-scale processors across America.

It's widely believed IBM and AT&T began a head-to-head battle in January 1983, when the United States government ended anti-trust suits against both companies on the same day, thus freeing the companies for more aggressive competition. In America AT&T markets the 6300 and 7300 IBM-compatible micros, which compete against IBM.

In a separate move, AT&T and Amdahl recently announced a joint venture under which they

will attempt to market a packet-switching system to the Japanese.

HARD DISK ON A CARD

Mechanical microcomputer components in general have been coming down in size more slowly than purely electronic parts. Recently, however, a Californian hard disk maker has achieved a significant breakthrough: a 10 Mbyte hard disk on a plug-in card. The product, slated for first shipment (at \$US1095) in October, is being made by Plus Development Corporation, a wholly-owned subsidiary of Quantum in Milpitas, California.

The Hardcard is 33 cm long by 10 cm wide — the standard dimensions for a plug-in board — and only 2.5 cm thick. The unit is said to have a disk head access time of 65 milliseconds, compared to the 85 milliseconds required by the IBM PC XT's hard drive. Power consumption is very modest — less than 11 watts, according to the vendor — which means it can be used without fear of blowing out the power supply of the IBM PC.

One aspect of the marketing is especially interesting: the warranty apparently will allow users to swap malfunctioning cards on-the-spot for new ones. This assumes, of course, that users have adequate backup of the data on their own Hardcards, and that they trust the retailer (or the vendor) to destroy any confidential data on the card. □

Until now, your IBM PC has been working with its hands tied.



No matter how outstanding the performance of your PC, without communications its full potential has not been utilised. Now a new world has been opened up to you and your PC. The NetComm PC In/Modem is Australia's first IBM modem to be approved by Telecom — and it's internal, too. For the first time, packages like Crosstalk, Relay, Symphony or Open Access will work properly. And it's fully automatic. It gives you Auto Dial, Auto answer, Auto disconnect. It's also the first HAYES SMARTMODEM compatible Australian designed and manufactured modem. Now, via the telephone network, it can put your PC in touch with both local and overseas data bases and most other PC's throughout the world.

All this and Videotex too

Included with the modem you receive additional software as well. The PC Videotex software means you can directly access VIATEL, BULLETIN, AFTEL, ANZTELL as well as ELDERS IXL, plus news, stockmarket reports and a host of other information.

All this, for \$848, inclusive of tax

That's all it costs for what *PC World* has called "a landmark peripheral" and which *Your Computer* has judged to be the winner of its "Best Australian Hardware Award" for 1985. If you want to untie the hands of your PC, see your PC dealer today, or contact NetComm direct for further information.



FREE DISKETTE OFFER

Get your FREE diskette with full operation information on the PC In/Modem and the full range of NetComm MicroComputer communications products. Offer expires June 30th.

TO NetComm (Aust) Pty Ltd P.O. Box 284, Pymble 2073 NSW

☐ Please send me the free diskette on the NetComm PC In/Modem
I have an ☐ IBM PC ☐ PCXT ☐ PC Portable

MY NAME _____

ADDRESS _____

P CODE _____

PHONE _____

MY COMPANY NAME, CONSULTANCY, OR SERVICE _____

NetComm

Australia's Network to the world

NetComm (Aust) Pty Ltd PO Box 284 Pymble 2073 NSW Tel: (+61-2) 498 5577 Telex: Sycom AA27113 (NETCOMM)
Minerva: 58: DNC002 Viatel: 249855770

NEI FPC



When you can't
afford mistakes.

There really is a difference
in diskette brands.

It's in the way they are
made.

Because the computer
industry cannot afford
variation in the quality of
diskettes, at Nashua we
looked for, and found a
way to ensure absolute
consistency.

Here's how we do it.

Quality Circles.

At Nashua we've found
the best way to attain this
'consistency' is to ensure
that at each stage of
production our diskettes



are statistically checked to
make sure the quality is
'built-in' every step of the
way.

Rather than long
production lines, we have
'Quality Circles' – small
groups of people whose job
it is to make sure that each
Nashua diskette is right in
the first place.

The result is a diskette
with such consistency, that
it is chosen by those people
who can't afford mistakes.

Phone Sydney 958 2044,
Canberra 47 0511,
Melbourne 428 0501,
Brisbane 369 4244,
Adelaide 42 0021, Perth
328 1888, Darwin 81 6204,
Auckland 2784 299,
Christchurch/Dunedin
Whitcoulls Ltd, PNG
25 6766.



There really is a difference.

Ruwald & Skinner 401 NA/A



COMMUNICATIONS A BAUDY TALE

In a little over three years Australia has undergone a veritable data communications revolution, which is continuing with increasing technological sophistication appearing at all levels. Bill Bolton, our resident comms historian, here documents our boudy past, and samples some of the delights of the present.

It's an exciting thought to realise the number of publicly accessible communications 'destinations' in Australia has increased by approximately 1500 per cent in three years. Much of this increase has come from small, micro-computer-based public access messages systems (see the PAMS listing in this article), but there have been some significant moves by commercial services into the videotex area.

Why choose only to refer to the past three years? Prior to mid-1982 the only 'direct-connect' modems readily available to the public had to be leased from Telecom through its Datel service. This was an expensive and unwieldy arrangement, which meant that generally only moderate to high-volume business users could justify using direct-connect modems. The alternative for low-volume users was to use acoustic couplers, which were cumbersome and, due to the general technology level involved, not particularly reliable.

At that time in Australia, data communications was restricted mainly to dumb terminals talking to mainframe hosts, or mainframe to mainframe synchronous communications. One of the reasons I started the Software Tools RCPM was to gain some practical experience with small-systems communications, as I'd found next to no one here who knew anything at all about it.

From mid-1982 Telecom-approved direct-connect modems started to become commercially available, for around \$300.

As well as accessing Australian destinations, Austrpac allows connection via OTC's MIDAS to many other similar data-packet networks throughout the world.

You could then own a modem which was convenient to use and gave a highly reliable data connection in most cases. Auto-answer modems also appeared, enabling users to set up their own 'host' systems for whatever purpose they wished. The number of computer users with modems grew rapidly, and snowballed with the increasing number of systems available to call.

This growth took place when standard modems were using 300 bps (that's about 30 characters a second) data rates, since that was the most commercially viable technology for establishing a modem market in Australia.

Meanwhile, in America

About the time Australia was waking up to the possibilities of broadly based public data communications, the United States was well and truly through that first phase of development. The need for faster com-

munications was driving the market from a 300 bps data communications rate to a 1200 bps (about 120 characters a second) data rate.

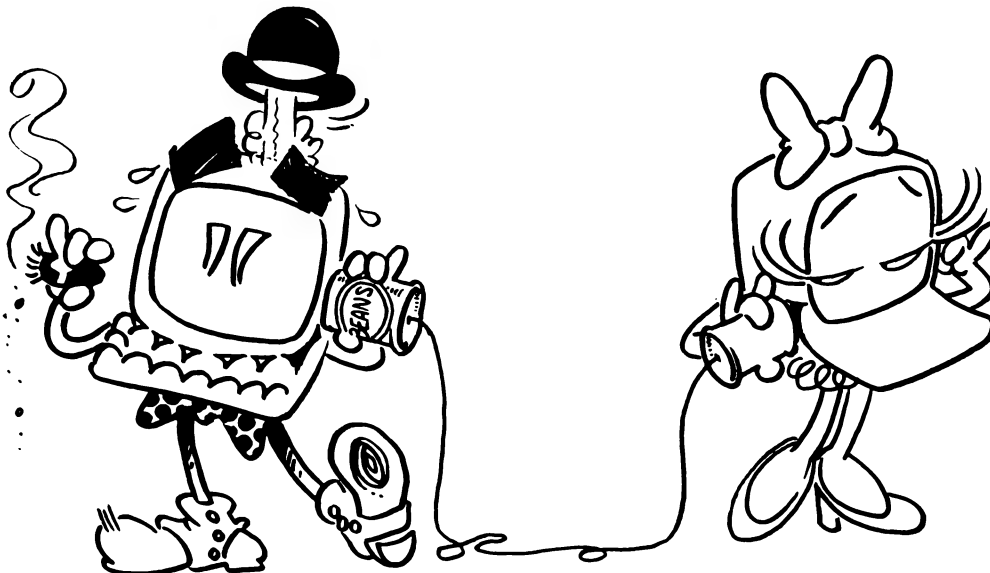
Telecommunications in the United States was never as tightly regulated as it is in Australia, allowing a wide variety of data communications services to develop over a long period of time. Australians looked at what was taking place in the United States market and tried to import at least some of the American ideas. A few types of data communications services have survived the Pacific crossing to become a great success, such as the concept of public access message systems. Others, such as commercial information utilities, have so far met with only a lukewarm response.

Performance

A good part of the success or failure of particular services has been due to the difference in the commonly available communications rates in the United States and Australia. Just saying that 1200 bps is four times as fast as 300 bps doesn't give you any real idea of the significance of that speed increase. In many cases the psychological impact of data communication speeds is considerable; things which work well at 1200 bps can be incredibly tedious at 300 bps. This is one reason why commercial information utilities have so far met with poor acceptance here.

For several years I have been regularly using one or the other of the two major American commercial information utilities. While I was only able to access the services at 300 bps, I more or less stoically accepted the general performance level, but I always felt there seemed to be little sense in the endless menus I was presented with. I spent a lot of time figuring out ways to circumvent the menu systems and got lost half the time in a complex array of service choices.

About 18 months ago I started using 1200 bps to access these information utilities and my whole view of them changed. In retrospect, it was obvious that whoever had designed them had assumed not many users would be accessing them at 300 bps, and had carefully set everything up to work most effectively, from a human communications point of view, at 1200 bps. At the higher speed the menu systems actually worked as 'road maps' through the complexity of services, whereas at 300 bps they were more of a distraction than any-



COMMUNICATIONS - A BAUDY TALE

thing else. The 300 bps rate had encouraged me to read and answer everything while on-line, but the fast 1200 bps rate changed my mode of operation, enabling me to capture what I wanted and read it later off-line. I'd then prepare my replies off-line and send them as files back to the utility, rather than typing them in directly. Technically, there was no reason why I couldn't have done this at 300 bps, it's just that psychologically it wasn't attractive to me.

The problem on the whole with Australian commercial information utilities is that they have either been modelled closely on similar American systems, or if locally developed have had little thought put into the nature of their user interfaces for low-speed communications. In either case they have ended up being frustrating for 300 bps users.

Things are changing in Australia. A pseudo 1200 bps standard has appeared on many commercial modems (though for good technical reasons it is not widely used, except for videotex), while true full-duplex 1200 bps modems are now readily available. And instead of being nearly four years behind the United States in terms of introducing new small-systems communications technology, as was the case with 1200 bps full-duplex modems, Australia is now only a matter of months behind with 2400 bps full-duplex modem technology.

Available Services

There is quite a range of public data communications services available in Australia today. What follows is a brief and personal overview of some of these. I certainly don't use all the types of services available, and of those I do use, I access some only occasionally and some intensively. You should be aware that there are more public and private communications services available than are mentioned here.

Packet Networks

There are two publicly accessible, general-traffic 'packet networks' in Australia. Telecom Australia runs a service called Austpac, which covers most capital cities and some provincial centres. Most small-system users access Austpac via casual 'dial-up' access ports, at 300 bps full duplex, 1200/75 bps or 1200 bps full duplex. Most host services on Austpac are connected via synchronous X.25 links.

Austpac communications charges are generally much lower than equivalent STD

It seems to me the major problem with Viatel is that the information density is too low. In other words, you have to look at several screens to get any worthwhile amount of information — and that takes time.

phone rates. You can be charged for Austpac in one of two ways. First, you can apply to Telecom for an NUI (Network User Identifier). Once Telecom has issued you with an NUI you can log onto any publicly accessible packet service on Austpac or an interconnected network, and your communications charges will be billed to you by Telecom. With Australian host services it is possible to arrange reverse charging, which means you wouldn't need an NUI from Telecom. The host service provider gives you its Austpac address, and when you log into Austpac and specify that address, the Austpac charges go to the host service. The host service provider then bills you for Austpac communications charges, and for your connect time to the host. Teledata is one Australian service that supports reverse charging.

As well as accessing Australian destinations, Austpac allows connection via OTC's MIDAS to many other similar data-packet networks throughout the world. MIDAS is the second packet network directly accessible in Australia. As well as being accessible through Austpac, MIDAS can be dialled directly from anywhere in Australia — though now the MIDAS charges are set in such a way as to encourage users to access it via Austpac where possible.

MIDAS is the data communications gateway to the rest of the world. I regularly access several United States communications services using Austpac/MIDAS, and on the whole it's not much more complicated than directly dialling a data service here in Australia. Of course, international communications of any sort are never cheap, but the MIDAS charges are commercially bearable, and in many cases data communication via MIDAS is the only way

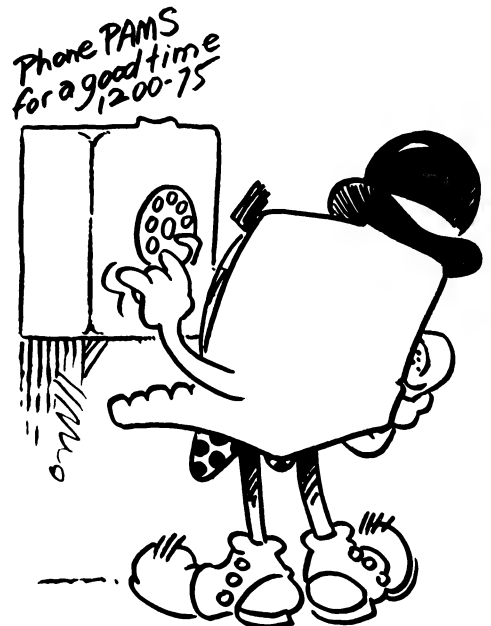
to get vital business or technical information quickly from overseas.

United States Services via MIDAS

I regularly use several United States data communications services. These fall into two classes: mail systems and information utilities. Arcom Pacific, the company I work for, communicates with several of its suppliers via electronic mail.

The service we use most in the office is MCI Mail, a slick electronic mail system which is easy to operate and provides a wide range of facilities for delivering messages electronically or generating hard copy in the United States for courier or postal delivery. You can also send telexes through MCI Mail. The interface, or PAD (packet assembler/disassembler), between MIDAS and the MCI network in the United States is half duplex, which means you have to be careful when entering messages by hand. Though MCI is working on correcting this problem for its international customers, at the moment it's advisable to prepare messages off-line and upload them. OTC can provide information about signing up for MCI Mail.

Easylink is another American electronic mail system. I've only tried to use it a few times — and without much success, since many of the messages I sent didn't seem to reach their destination properly. The Easylink user interface is complex and hard to remember. A business associate uses ►



AUSTRALIAN DIAL-UP SERVICES...

Easylink just to send telexes to the United States and says it works well for that.

The information utility I use is the CompuServe Executive Information Service (or CIS), a broadly based information utility providing a very wide range of services from home entertainment through business data, general news, airline/travel planning and booking, financial news, electronic mail, electronic publishing, file storage and forwarding, special-interest group information and so on.

Several of Arcom Pacific's software suppliers have special interest groups (SIGs) on CIS. These SIGs provide an important source of news, views and technical information that is vital for the effective marketing and support of Arcom's pro-

ducts in Australia and New Zealand.

CIS is well maintained and easy to use. Many features may be programmed by the user to suit his or her particular needs, and the CIS on-line help systems and printed documentation have been well thought out. You can transfer files to CIS using either of two CIS protocols or the Christensen protocol.

CIS accounts have been hard to obtain in Australia, but they are available. The best places to start asking about a CIS sign-up are computer user groups, or on local PAMS systems.

Until the beginning of this year I was using the Source information utility, but cancelled my account after finding CIS to be superior. Some of Arcom's suppliers

have now started to provide SIGs on the Source, so I may have to open an account there again. Accounts on the Source have been available in Australia for several years; again, the best places to ask are local computer user groups or PAM systems.

Australian Services via Austpac

The only public access domestic service I have used via Austpac is Teledata in Melbourne. Teledata was formerly the Australian Beginning, but has been working hard on its image and services recently. Frankly, the old Australian Beginning was not a very handy communications utility. It was difficult to drive and had no worthwhile file transfer capabilities. Teledata is im-

PAMS Numbers

Australia

Queensland (EST)

Software Tools RCPM (ST-RCPM) (07) 378 9530 24 hours
BEX II RCPM (BEX-RCPM) (07) 395 1809 24 hours
Tomorrowland DIRECT (BRIS-TLD) (07) 286 2438 24 hours
COMPETRON IBBS (COMPT-IBBS) (07) 52 9294 24 hours
Hi-Tech C BBS (HTC-BBS) (07) 38 6872 24 hours
Texas Instruments (TI-BBS) (07) 263 6161 2100-0600 weekdays only
Brisbane Microbee RCPM (BMUG-RCPM) (07) 38 4833 24 hours
ACEA Commodore BBS (ACEA-BBS) (07) 341 0285 24 hours
Commodore Users BBS (BCUG-BBS) (07) 808 2125 24 hours
Cairns and District IBBS (CAD-IBBS) (070) 51 3582 1800-0800 + 24 hours weekends
Color Computer Link (COCO-LINK) (075) 32 6340 24 hours

New South Wales (EST)

Mi-Computer Club BBS (MiCC-BBS) (02) 662 1686 24 hours
Sydney Public Access RCPM (SPA-RCPM) (02) 808 3536 24 hours
Ausborne UG RCPM (AUSBD-RCPM) (02) 95 5377 24 hours
Tesseract RCPM (TES-RCPM) (02) 651-1404 24 hours
Omen RTRS (OM-RTRS) (02) 498 2495 1630-0900 + 24 hours weekends
Sydney TRS-80 UG RTRS (STRUG-RTRS) (02) 332 2494 24 hours
Prophet BBS (PROPHET-BBS) (02) 628 7030 24 hours
Dick Smith Electronics (DSE-BBS) (02) 887 2276 24 hours
Tomorrowland DIRECT (SYD-TLD) (02) 411 2053 24 hours
Sydney Apple UG (AUG-BBS) (02) 451 6575 24 hours
Texas Instruments UG (TEXPAC-BBS) (02) 560-0926 1900-0600 + 24 hours weekends
Oracle RTRS (ORACLE-RTRS) (02) 960 3641 0-1800 weekdays, 0-0800 weekends
Sydney Commodore 64 BBS (SYDC64-BBS) (02) 664 2334 24 hours
AUGUR BBS (AUGUR-BBS) (02) 661 4739 24 hours
ABCOM-IBBS (ABCOM-IBBS) (047) 36 4165 24 hours
Newcastle Micro RCPM (NMC-RCPM) (049) 68 5385 1700-0830 + 24 hours weekends

ACT (EST)

Canberra IBBS (ACT-IBBS) (062) 58-1406 24 hours

Victoria (EST)

Melbourne CBBS (MICOM-CBBS) (03) 762 5088 24 hours
TARDIS RCPM (TARDIS-RCPM) (03) 67 7760 1800-0800 + 24 hours weekends
Sorcerer CUA RCPM (SCUA-RCPM) (03) 434 3529 24 hours
East Ringwood RCPM (ERING-RCPM) (03) 870 4623 1600-2400 daily
PC Connection IBBS (PCC-IBBS) (03) 528 3750 24 hours
HiSoft IBBS (HISOFT-IBBS) (03) 799 2001 24 hours
Computers Galore IBBS (CG-IBBS) (03) 561 8479 24 hours
OMEN IV RTRS (OM4-RTRS) (03) 846 4034 24 hours
MicroPro Computers RCPM (MICROP-RCPM) (03) 568 8180 24 hours
AM-NET RCPM (AMNET-RCPM) (03) 366 7055 24 hours
Microbee User Group RCPM (MMUG-RCPM) (03) 873 5734 24 hours
Gippsland MAIL BUS (GL-MBUS) (051) 27 7245 24 hours

Tasmania (EST)

Mike Scott's BBS (MS-BBS) (003) 34 9411 24 hours

South Australia (CST)

Adelaide Micro UG BBS (AMUG-BBS) (08) 271 2043 1000-2200
Computer Ventures BBS (CV-BBS) (08) 255 9146 24 hours
Electronic Oracle IBBS (EO-IBBS) (08) 260 6686 24 hours
OMEN V RTRS (OM5-RTRS) (08) 45 4666 1800-0700
NEXUS Ed. Dept BBS (NEXUS-BBS) (08) 243 2477 24 hours
Multiple BBS (MULTI-BBS) (08) 255 5116 24 hours
SA Commodore BBS (SAC64-BBS) (08) 382 4631 24 hours

Northern Territory (CST)

Outback RCPM (OUTB-RCPM) (089) 27 7111 24 hours
OMEN II RTRS (OM2-RTRS) (089) 27 4454 24 hours
Red Centre RCPM (REDC-RCPM) (089) 52 8852 24 hours

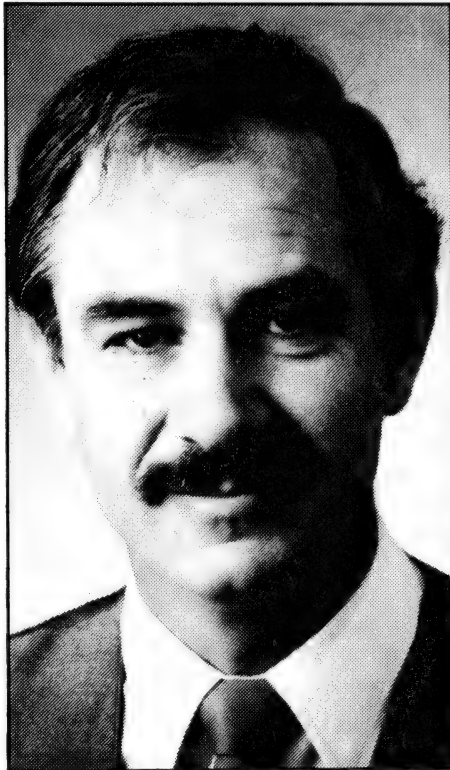
Western Australia (WST)

OMEN III RTRS (OM3-RTRS) (09) 279 8555 0800-2400 + 24 hours weekends

New Zealand (NZT)

Attache RBBS (ATT-RBBS) ISD: 64 9 78 9084; Domestic: (09) 76 9084 24 hours
Rotorua BBS (ROT-BBS) ISD: 64 73 70 154; Domestic: (073) 70 154

What the experts think about Labtam Computers



KARL REED, Lecturer in Computer Science at Royal Melbourne Institute of Technology.

"There are a number of reasons why a multi-user 8086 is a good product. The most important is that small business can have several people who need access to the same database and application, and this cannot be achieved in a practical fashion by a collection of PCs or other micro-computers."

"Have a look at the Labtam 3003, it's running multiple users."

"An IBM class machine running several users."

"It was clearly a multi-user desktop machine and that was something for Australia and Labtam to be proud of."

"I guess I regard the Labtam 3003 desktop as being more important than its UNIX (Labtam's) machine because it is meeting commercial needs that were obvious, and which have been missed by almost every other supplier."

From "An Essential Reed".

By Karl Reed

Extract from Computerworld, May 31 1985.

Labtam Series 3000 multiple user computer systems in 8, 16 or 32 bit configurations built for personal/ micro/ and mainframe computer applications.



LABTAM: Head Office, Victoria. Telephone: (03) 587 1444.

New South Wales. Telephone: (02) 411 2588.

ACCREDITED DEALERS: A.M.S., New South Wales. Telephone: (02) 671 5800.

KPA Computer Systems, Queensland. Telephone: (07) 378 9877.

General Business Machines, South Australia. Telephone: (08) 42 0031.

Macton Pty. Ltd., Western Australia. Telephone: (09) 382 3622.

Labtam Computers, You now know about us.

plementing a new user interface which promises to be much better than the previous one, and will also soon have Christensen and Kermit protocols available for file transfers.

An exciting development on Teledata is the introduction of 'gateways' to overseas communications utilities. At present the only gateway is to the 'Official Airlines Guide' in the United States, but Teledata is working on opening up gateways to other services such as Compuserve and the Source. The advantage of accessing these services through Teledata is that accounts can be opened locally, and you'll also be billed by the local organisation.

These new developments could make Teledata a very useful public access communications utility for Australia, and the people behind the service certainly seem to be trying very hard to overcome the indifferent reputation it has had to date.

Australian Dial-up Services

By 'dial-up' in this case I mean services connected directly to the public switched telephone network, rather than to a packet network.

For me these are almost exclusively public access message systems of one sort or another. They cover a wide range of activities, but are mostly directed at distributing public domain software for microcomputers. The services are characterised by being single-user, with one telephone line (though a few are expanding to multiple lines), and generally specialising in only a few types of computers or operating systems. At the time of writing only two systems were supporting data communications rates higher than 300 bps. The Outback RCPM in Darwin supports 300

It appears even the videotex service vendors who are promoting the use of Viatel have problems with it. I left messages to several service vendors and equipment suppliers via their response facilities on Viatel, requesting information for this article, and didn't get any replies. Maybe they don't collect their electronic mail!

bps and 1200/75 bps, while my Software Tools RCPM in Brisbane supports 1200 and 2400 bps. I think this will change rapidly and many systems will soon provide 1200 bps and possibly 2400 bps access.

PAMS systems are a rich source of useful software and ideas, and an excellent place to find out what is really happening with small-systems communications. *Your Computer* usually carries a column about PAMS systems (not this month — you have this article instead), so I won't labour the point by going into more detail.

Viatel

The last type of service I use is Viatel. Now I haven't made up my mind about Viatel yet.

I signed up because the \$12.50 introductory offer for a year's subscription was too good to refuse, but until recently I haven't found much use for this facility.

It seems to me the major problem with Viatel is that the information density is too low. In other words, you have to look at several screens to get any worthwhile amount of information — and that takes time. Recently Arcom Pacific's financial controller discovered some financial services on Viatel that were commercially useful to the business, so we have been getting some use from it lately, but that's only a couple of pages from the whole service.

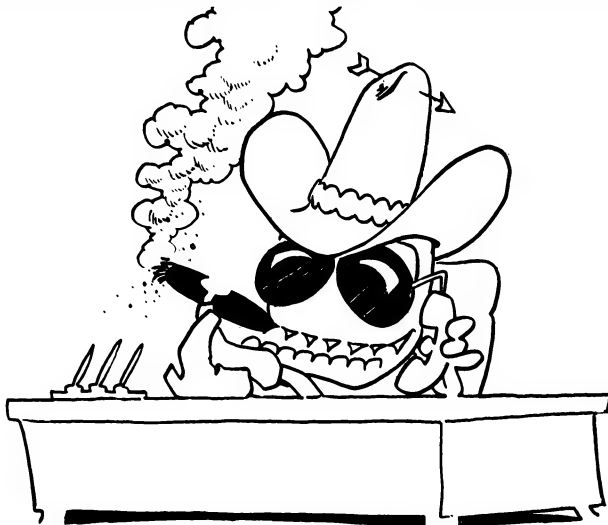
It appears even the videotex service vendors who are promoting the use of Viatel have problems with it. I left messages to several service vendors and equipment suppliers via their response facilities on Viatel, requesting information for this article, and didn't get any replies. Maybe they don't collect their electronic mail!

At the moment Viatel just doesn't offer many services of any value to me, either personally or professionally, so I guess it's got until next February when my account is due for renewal to convince me I should renew. I have been frustrated by the fact, that I need a special modem just to access Viatel, as I find the 1200/75 modem standard not reliable enough for general use. Despite several requests to Telecom, staff there won't say if it intends to provide 1200 bps full-duplex public access to Viatel, and I think the service runs the risk of being left behind if it doesn't provide this more reliable mode.

If you want to sign up for Viatel, just ask any Telecom Business Office for details.

Trends

The thing to look for is higher-speed communications as 1200 bps and 2400 bps modems penetrate the Australian marketplace. Gateway services such as those coming into operation through Teledata will open up a broader range of data communications to the small-systems user. At least some of the PAMS systems will find ways of getting onto Austpac, which should make them more accessible to interstate callers. The sophistication of small-systems communications software will advance by leaps and bounds in a short time, and Australian PC data communications users will catch up rapidly with their United States counterparts in the way they use computer communications. □



MEANWHILE, IN AMERICA....

THE CLEAR ADVANTAGE

THE OSBORNE PC

COMPANY ADVANTAGE

Osborne has set industry standards for the computer world. We are known for producing the most reliable best selling (over 200,000 users) personal computer systems. We are proud that our designs and level of quality created a new awareness and inspired other excellent companies to follow our thinking.

PC ADVANTAGE

NOW you can buy the **OSBORNE 16 bit PC** with our name and reputation up front. This exact IBM PC compatible has operational flexibility and day-in day-out Osborne reliability.

Running under Osborne's unique **TRANS-NET** local area network it will share a common network with up to 255 other Osborne PCs, IBMs or compatible micro-computers.

COMPATIBILITY ADVANTAGE

The **Osborne PC** is fully IBM hardware and software compatible and expandable. It will run all commercially available software including Lotus 123, Symphony, Framework, Flight Simulator etc. It supports all add-on boards and cards including Hercules, Persyst, 3270 Emulation and 3-Com LAN. The Osborne 2100 is ideal for CAD/CAM applications supporting all high resolution peripherals including Tecmar cards and monitors. The **Osborne PC** will cold boot and run PC-DOS (all versions).

PRICE ADVANTAGE — FROM \$3,200

With every new release we have exceeded the specifications of most of our competitors, increased the quality and produced significant cost savings for our buyers. Osborne's outstanding **value-for-money** policy is your biggest advantage.

TECHNICAL ADVANTAGE

- 256k Main Memory, expandable to 640k.
- Five expansion slots.
- Two slim-line 360k EPSON floppy drives.
- 10mb or 20 mb Factory Fitted Hard disk (optional).
- Parallel — composite mono, colour, TTL.
- XT heavy duty power supply.
- On-board sockets for 8087 co-processor and ROM Basic.
- Improved IBM style Keytronics keyboard.
- Full diagnostics.
- Operating System — MS-DOS 2.11 (standard), PC-DOS, CP/M 86, Concurrent CP/M, Concurrent PC-DOS.

WARRANTY ADVANTAGE

Full SIX MONTHS warranty. Service and backup Australia-wide from Hills Industries.

BONUS SOFTWARE ADVANTAGE

Osborne is the only PC that offers you the Release 2 Advanced Perfect Software Library for an incredible \$200.

Available Australia-wide from

OSBORNE

93 York St., SYDNEY. Phone 290-1122.

Telex 70510.

Fax 290-1558

★ **BONUS** ★ **BONUS** ★ **BONUS** ★
Every PC includes a **FREE** 1 year subscription
to Your Computer Magazine.

Melbourne 20-7895,
Perth 384-5787,
Brisbane 870-3780,
Darwin 84-4636 Caringbah 524-6240,
Wollongong 27-1440, Sydney 290-1317.



Let's Talk GrafTalk™

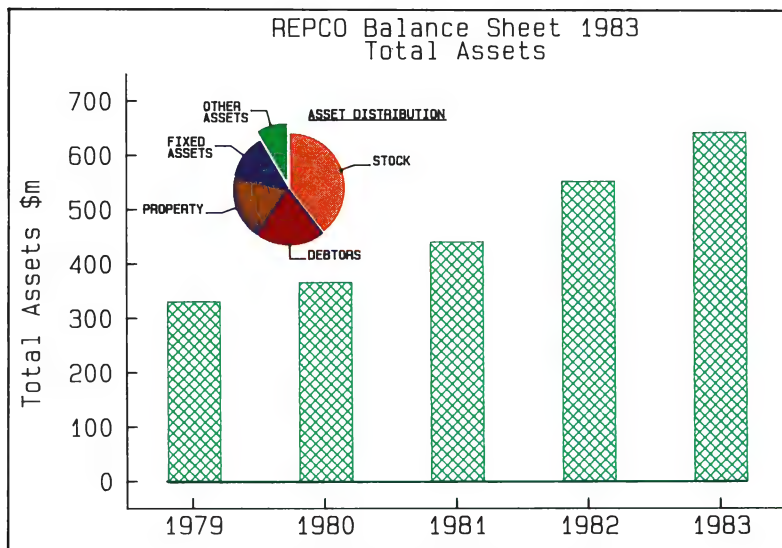
GrafTalk is business graphics software that works as hard for your business as you do.

You can use GrafTalk the way you'd like.

GrafTalk is flexible in accepting commands. You can type English-language commands interactively, run commands from disk files or the in-built editor, or use GrafTalk's menus if you prefer.

GrafTalk has all the graphics features you need.

Choose from stacked, percentage, clustered or floating bars; exploded pies, line plots, scatter diagrams and combinations of all of these. Adjust styles and sizes to suit your needs.



PREPARE DISPLAYS FOR ANNUAL REPORTS

Chances are it works with the hardware you already have.

GrafTalk runs on CP/M-80 systems (even those without screen graphics), the IBM-PC, Sirius, DEC Rainbow, Zenith Z100, and many more. 16-bit systems need only 128kB of memory.

GrafTalk drives so many screens, plotters, and printers that we don't have room to list them all. Development is continuing — watch for the release of support for Apricot and the Textronic color ink-jet printer.

(Charts shown here were produced with Houston and Hewlett-Packard plotters, on a Televideo 803.)

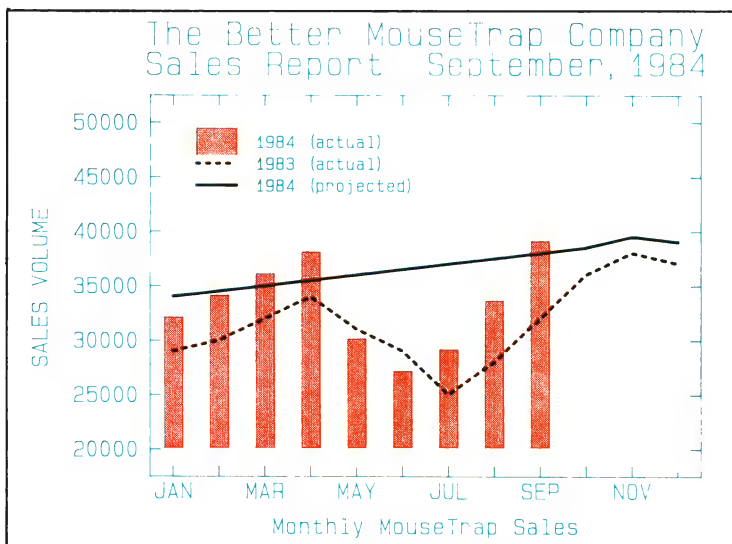
GrafTalk is a trademark of Redding Group Inc.
CP/M is a registered trademark of Digital Research.

GrafTalk is easy to use

Even a first time user can produce a sophisticated graph with a few simple commands. As you gain more experience, you can choose to use any of GrafTalk's more than 100 commands. Commands are available that allow all degrees of "fine tuning" for your graphs.

GrafTalk has excellent documentation

GrafTalk's documentation is readable, complete and easy to use. The User's Manual consists of full color examples designed to show you step-by-step how to produce the graphs you want. The Reference Manual classifies and describes fully every available command.



UPDATE MONTHLY REPORTS QUICKLY AND EASILY

Features of GrafTalk

Flexible Data Input

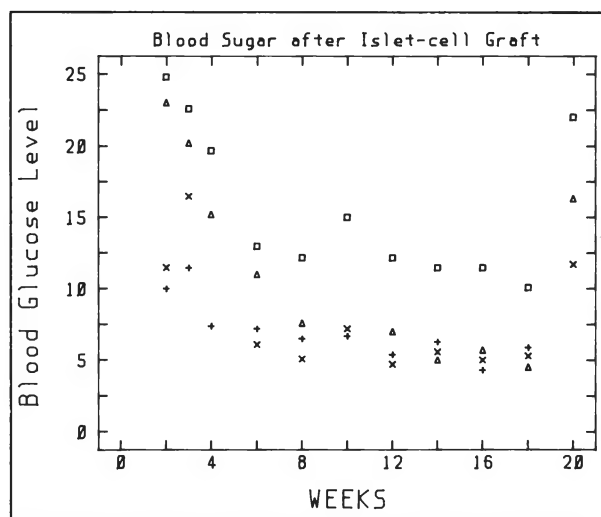
GrafTalk will extract data from any text file, including Printer files from most spreadsheet programs. Blank lines and headings are ignored. Unwanted data can be easily masked off. Commas, dollars signs etc do not affect the interpretation of data values.

Mini Spread Sheet

The inbuilt spreadsheet allows the user to view and adjust data, perform arithmetic operations, create new rows and columns, name rows and columns, create sub-sets, and output data to disk or printer. Unassigned values are allowed.

Menu Mode

High-speed screen oriented menus are provided. Write your own menus for your standard operations. Switch between menu mode and command mode at any time.



SUITABLE FOR BOTH SCIENTIFIC AND BUSINESS APPLICATIONS.

Axes Features

Adjust the number and position of axes. Select numeric labels, or text or special labels such as months, days or years. You can use automatic scaling, or nominate the range for each axis.

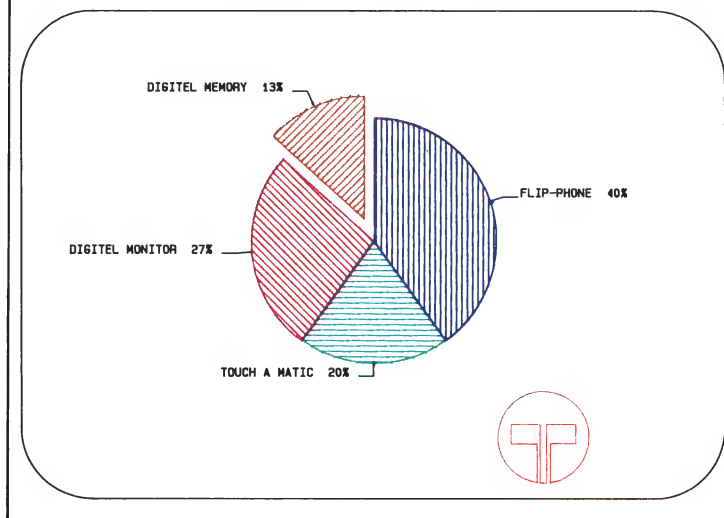
Interactive Graphics

Use the joystick, mouse, or light pen to select a region on the screen, and position legends and text.

Advanced Features

Declare variables, interactive sketch commands, circle and arc, absolute and relative moves, draws and marks, screen or graph coordinate systems.

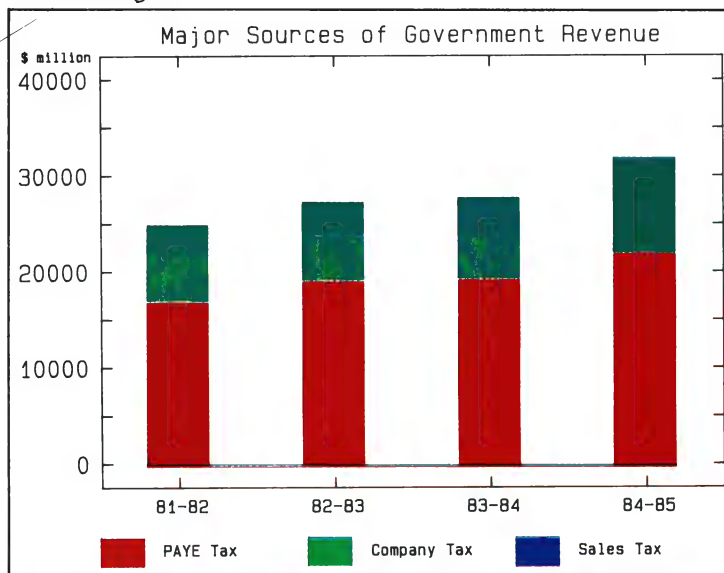
SPECIALITY HANDSET SALES



ADD LOGOS WITH MOVE, DRAW AND ARC COMMANDS.

Editor

The powerful screen-oriented text editor within GrafTalk is a very valuable tool for developing graphics. It can be used to create files containing commands, data or both. The editor has commands to allow you to run all or part of a file. If errors are found during execution, GrafTalk returns to the editor, with the cursor pointing to the offending line.



**GrafTalk Speaks
Your Mind**

Price: \$570 (ex Sales Tax)

DEALER ENQUIRIES WELCOME

GrafTalk is distributed in Australia by:

FMS

95 Canterbury Rd, Middle Park, Victoria 3206.
Telephone: (03) 699 9899. Telex: AA 31604.

BULLETIN BOARD BACKCHAT

Being System Operator (sysop) of 'Your Computer's' bulletin board has been an educational experience for Rose Vines. Not only has she had to learn — quick smart — what all this communications business is about, but has also experienced, at true gut level, the truth of such adages as "You can't please all the people all the time".

Bulletin Board Backchat

This is the worst noticeboard I have ever called! I demand my money back or I'll sue you for \$10 million, and I mean what I say. I prefer the money in unmarked \$100 bills left in a briefcase outside Town Hall. Be there."

"Excellent BBS. Had trouble with the others but this was great. The only one that worked properly. Keep up the good work."

WHEN FIRST handed the job of looking after the *Your Computer* bulletin board after the departure of our previous sysop, I thought I'd quickly have a new broom through the whole system and change the shape of life on our BBS. Now, three months later, I'm still scratching the surface. It's not through lack of enthusiasm — although the original razor's edge of my ambition has been just a teensy bit dulled — but rather through an avalanche of usually conflicting requests and comments from users of the system.

In an attempt to respond to some of the pleas, criticisms, congratulations and queries, and to give BBS users a taste of life on the other end of the line, I thought I'd share some of my electronic mail.

Big Brother

"This being the first BBS I've accessed, my impressions are that it's great. By the way, do you allow homosexuals on the board?"

The only people not allowed on the board are those who want to mess it up for other people. Occasionally someone logs on and tries to wreck the system, or leaves a program which will do damage, or is generally abusive. These people will find access to the system is soon denied and their names passed on to other sysops throughout the country.

Sometimes people have rampaged round the system using someone else's ID. Make sure you are the only person who knows your password, or you'll bear the consequences of trouble caused in your name. One piece of mail might interest those who've heard of various cases of computer fraud reported from the States: "This is the NSW Police Communications Section — just checking your system. Thanks for the look around, we'll call again sometime."

BULLETIN BOARD BACKCHAT

Changes

"Come on, Austpac! ... Are you still having problems after three years? ... Where has the hard disk gone? ... Isn't this system kinda slow? ... Is that advertisement from January 1984 still current?"

Things *do* change on the bulletin board, but not at what you might call a frenetic pace. In the last few months we've managed to clean up a lot of the dead wood that's been cluttering up the system, and software maintenance is happening often enough for regular users to notice it.

After the system closed down for a while last year when we moved house, we lost our hard disk to one of the other computer systems in the building, and the pol-tergeists have foiled us each time we've been about to put it up again. At the moment, we're first in line to get the Fujitsu drive which is in sick bay at Facom. If they get their act into gear, it should be up by the time you read this. That'll mean a faster system with lots more elbow room.

We're also planning to implement some much needed software improvements when we get the Fujitsu up and running again. These include providing visitors with directories and descriptions of the programs available on the system (perhaps the most requested enhancement to the system); more programs for a wider variety of machines, including languages such as dBase and C; and multi-user access. Future plans include getting onto Austpac, which should make life for STDers a little more bearable.

The Board

"I've been wandering around in circles for ages, and I still can't find the programs; where are they? ... Your mailbox service is very difficult to understand ... A most comprehensive and complex board, with excellent structures ... Even a computer dumbo like me could use this system!"

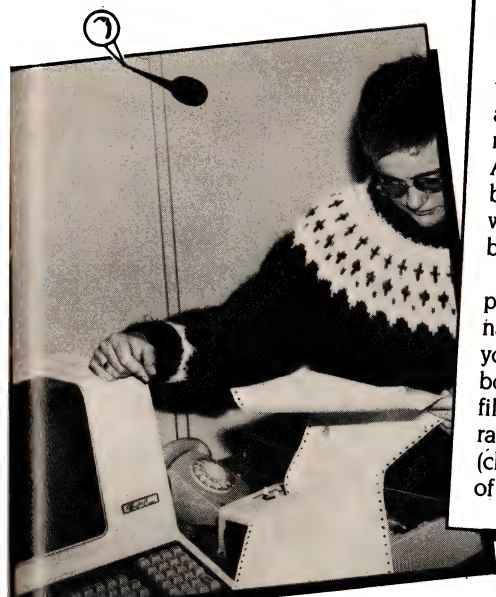
The board is entered from CP/M by typing 'board' (wow!). Members respond to the ID? prompt with their membership number and password, separated by a hyphen. Visitors are given restricted access, and should respond 'VISITOR'.

Help on how to use the system is provided by typing '?' at the prompt. There are four main command types: ADV, NOTE, MEET and MAIL. These commands, combined with the prefixes 'M' (Menu), 'V' (View), 'P' (place or 'D' (Delete), give you access to the advertisements, notices, meetings and mail sections of the board.

To get to the program area, you type 'PROGRAMS'. The programs are currently stored on drive B: area 3. If you want a copy of a program, one way of getting it is to list it and store it in a buffer as it comes down the line. The danger with this method is that any hiccups in the transmission may cause headaches when you try to run the program.

A better way to download a program is to use a communications utility which automatically checks for errors in transmission. We use XYAM (a version of Yet Another Modem), which sends data in 128-byte blocks, followed by a checksum to see whether the data arrived intact (if not, the block is sent again).

To run XYAM, type 'XYAM' at the 3B> prompt. To receive a file, you type 's filename' (where *filename* is the name of the file you want to place the program in) at the board end and then issue the command 'r filename' to your own machine. The programs are categorised under machine type (check the HELP PROGRAMS file for a list of the categories).



FMS 'C'

Tools for the Professional

Fortrix 'C' \$1250
Fortran to 'C' Translator

Bastoc \$885
Basic to 'C' Translator

Basic C \$309
C source functions which simulate BASIC

Lattice-Window \$550
Simple to use multiple full windows for IBM-PC

Lattice db-C \$338
ISAM library with DBASE II or III file compatibility

Lattice LMK (UNIX make) \$416
Track dependencies. Builds batch files automatically

C Cross Reference Generator \$176
Symbol listings and line references

BTRIEVE for PCDOS .. \$467
B-Tree subsystem

PHACT \$475
Portable B-Tree subsystem

MSD C Debugger for PCDOS \$392
Source level C debugger

PFINISH \$523
Execution timing analysis

PFIX for PC/MS-DOS .. \$384
Multi window debugger

PFIX Plus \$716
Symbolic version

Update your early Microsoft/
Lattice C for \$250.00.

Source code available for many products.

FREE C CATALOGUE

Available exclusively in Australia from:

FAGAN

MICROPROCESSOR SYSTEMS

95 Canterbury Road, Middle Park, Vic. 3206
Tel: (03) 699 9899 Telex: AA31604

BULLETIN BOARD BACKCHAT

Logging on

"Help" is hopeless ... CP/M is hopeless ...
The help routines are very informative ...
Very good to see a board that uses CP/M
... Help! How do I talk to the '0A>' prompt?"

The board has three main areas: a Help section operated at CP/M level (CP/M is the standard 8-bit operating system, although our version has been modified to make it suitable for use on a BBS); the board itself, which contains all the facilities for leaving mail and notices and provides access to the programs on the system; and XYAM, our communications program, which lets you upload or download programs.

There is also a logon procedure. To access the board, you need your modem and communications software set up for: eight data bits, one stop bit, no parity, 300 baud, full duplex. After you've dialled (02) 662 1686 and got the carrier tone, the system will first ask you how many nulls you need (usually this is 0, but you might need to experiment a little), whether your terminal can display lower-case letters, and your name.

Once through the logon rigmarole, you're dumped at the CP/M prompt, 0A>. This seems to stump lots of people, even though immediately before entering CP/M you're told to type 'HELP' if you're not sure what to do.

HELP will produce a list of the basic CP/M commands and the other help files available. At this point you can get info on joining the system ('HELP JOIN'), the hardware and software on the system ('HELP THIS-SYS'), the board subsystem ('HELP BOARD'), the communications program ('HELP MODEM'), the programs section ('HELP PROGRAMS') and assorted other topics.

The Basics

"What is the Mi-Computer Club? What's the difference between it and the board? How do you join?"

Your Computer's bulletin board is officially known as the Mi-Computer Club Bulletin board. The MiCC was a consumer club which offered special rates on computer products and services as well as the BBS. The board is now the only surviving part of the club.

Membership of the board costs \$20 annually (payable to *Your Computer* at PO Box 227, Waterloo 2017). This fee gives you access to all the board's facilities, such as electronic mail, the general noticeboard and the programs section. For those who want to have a look around before joining, visitor access is available. As a visitor you can look at the notices and advertisements and leave messages to the sysop at the end of your session, but you can't get at the programs or place notices or mail.

The Sysop's Ear

"It's 2 am and the sysop is nowhere to be found. We were hoping to find a sysop and a cookbook program to provide breakfast, and we've found neither. What sort of a slack system is this?"

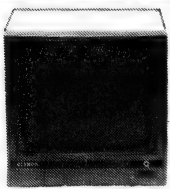
As with most sysops, the bulletin board is my second job. My first is working full-time for *Your Computer*, which is rather more than a 9 to 5 day. Routine bulletin board maintenance gets done whenever I'm passing the computer room and have a moment to spare. Anything more demanding tends to get done either late at night or on the weekend. This means my response time to enquiries and problems is something less than immediate.

If you want to get my attention, there are several alternatives. If you're a board member you can leave me mail via PMAIL addressed to member number 1. Members and visitors can leave comments after the BYE or LOGOFF commands when exiting the system. I generally look at this mail once a week and get around to replying every two to three weeks unless I notice something urgent.

Alternatively, you can use the CHAT command in XYAM. CHAT causes a bell to sound a few times to attract my attention. Unfortunately, the bulletin board computer is located down the other end of the corridor from where I work, so you have to be lucky to get me that way. If I am around, I always try to answer, and you're likely to get a less harried response from me outside normal business hours. I also sometimes initiate conversations on the board if I notice someone is having a terrible time trying to get things to work.

Perhaps the most successful way to get my attention is to phone (02) 663 9999 during office hours, a tactic which makes it difficult for me to avoid you. In any case, the questions I answer last are those which have already been answered on the board. Most of the information needed to get around the system is given in the various blurbs or help files available throughout the system; if the system suggests you type 'HELP' and you type 'TYPE BOARD.HLP', and then leave a comment about the unfriendly nature of the board, you'll be right!

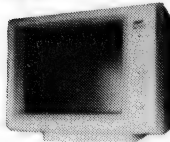
Mostly I enjoy all the communication on the board, including those people who bother to leave criticism of the system. Despite our time and hardware problems, we are keen to make the board responsive to your needs. So give us a yell if you want to see change, and in the meantime, have fun on the line. □



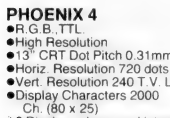
RITRON 1
Our most popular model in a steel cabinet to minimise R.F.I. interference.
Green, Cat. X14500 \$199
Amber Cat. X14500 \$209



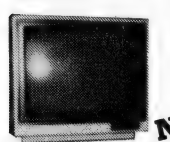
RITRON 2
Stylish swivel base monitor, available in amber or green.
1-9 Green Cat. X14500 \$10+
\$215 \$205
Amber Cat. X14500 \$219 \$205



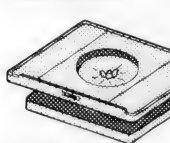
PHOENIX 5
Suits Apple, Commodore, even your VCR!
● Pal and R.G.B.
● Normal Resolution
● 13" CRT Dot Pitch 0.65mm
● Horiz. Resol. 320 TV lines
● Vert. Resol. 560 TV lines
● Display Characters 1,000 Ch. (40x25)
● 16 Colours (Pal)
● Green text display
Cat. X14522 \$499



PHOENIX 4
● R.G.B. TTL
● High Resolution
● 13" CRT Dot Pitch 0.31mm
● Horiz. Resolution 720 dots
● Vert. Resolution 240 T.V. Lines
● Display Characters 2000 Ch. (80 x 25)
● 8 Display colours and intensity
● Green text display
Cat. X14520 \$849



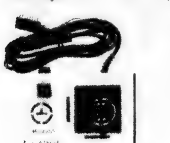
MITSUBISHI MONITORS
Green Cat. X14514 \$199
Amber Cat. X14516 \$209



SWIVEL BASE
Makes life easy!
Cat. D11100 \$29.50



ADD ON HARD DISK DRIVE FOR IBM
Includes disk controller card. Available and installed free only at our city store.
Cat. X20010 10 M Byte \$1,395
20 M Byte \$1,550



APPLE JOYSTICKS
Ideal for games or word processing. Fits most 6502 "compatible" computers.
Cat. C14200 \$29.95



NEW 180 CPS PRINTER!
KAITEC KAI 180 EX
Standard 80 column Dot Matrix Printer. High quality printing by NLQ mode. 2K Buffer. High-speed, low-energy consumption 9 wire dot head gives: Printing speed 180 C.P.S.
Logic seeking printing or incremental printing with high response, stepping motor. Use of fan-fold, roll or cut-sheet paper is possible with adjustable sprocket pin feed and friction feed. Both fixed and proportional character pitches are available. Emphasized and double print modes are possible. 9 graphic modes are available. 8 language international character font internalized.
SPECIFICATIONS:
Printing Type: Impact Dot Matrix
Maximum Printing Range: 203mm
Print Types: ASCII 96 Others 7 language
Character Format: Character Mode Standard 9 x 9 dots NLQ 18 x 20 dots Graphic Mode
Printer Modes: (a) Fixed pitch mode (b) Proportional pitch mode
Character Size: 2.42(H)x 1.99(W)
Printing Speed: 180 Character per sec. (pica)
Paper Feed Method: (a) Adjustable sprocket pin feed paper width 4-10 inch (pull through) (b) Friction feed paper width 4-8.5 inch
Paper Feed Pitch: (a) Standard pitch 1/6 inch (b) Min. pitch 1/216 inch
Ink Ribbon: Special ribbon cassettes
Power Requirements: 240V + 10% 50 Hz
External Dimensions: 408(W) x 314(D) x 96(H)mm
Weight: Approximately 7.2kg
Ambient Environment: (a) 5-C-40C (less than 90% RH)
(b) Horizontal operating surface
Reliability: (a) MTBF 3x10⁵ lines (excluding print head and ink ribbon) (b) Print head life: 100x10⁵ characters
Interface: Parallel interface 8-bit parallel (Conforms to Centronics)
Cat. C20020 \$690



MODEM PHONE
Check the features and the value for money of this stylish new modem phone...
● Speaker Phone with Built-in Amplifier for Detecting Busy Signal during communication.
● Auto/Manual Answer, Manual Originate, Auto Disconnect.
● Carrier Detect Indication, 20 Memories (each with 18 Digits Capacity) for Auto-dialing.
● BELL 103 CCITT V21 Compatible.
● 300 BPS Full Duplex.
● Last Number Redial.
● Pushbutton Keyboard.
● Volume High or Low Control.
● FCC Approved Direct Connect.
● "Inuse" Dialing Indicator.
Cat. X19105 \$199
(Not Telecom approved)



RITRON MULTI PURPOSE MODEM
Our New RITRON Multi Purpose Modem has arrived and has all the standards you require. Just check the Ritrone's features:
● CCITT V21 300 Buad Full duplex
● CCITT V23 1200/75
● Bell 103 300 Full duplex
● Bell 202 1200 Half duplex
● Auto answer, auto disconnect
Telecom Approval No. C84/37/134 \$379

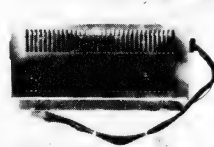
BAUD RATE/BIT CONVERTER FOR RITRON MODEM NEW!
Cat. \$99



CICADA 300
● 300 baud
● Provides full 12V bipolar output signal
● Direct connect modem
● Full duplex operation (Phone not included)
Cat. X19101 \$190



DISK STORAGE BOX
Holds over 50 disks!
Cat. X16075 \$34.50 \$29.00



QUALITY COMPUTER POWER SUPPLIES
IBM* (to suit) Cat. X11096 \$239
Apple* (to suit) Cat. X11095 \$139



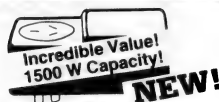
KEYBOARD AND CASE
Cat. X11080 \$249



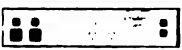
APPLE* COMPATIBLE CARDS
Printer Card Cat. X17029 \$95
Drive Card Cat. X17019 \$95
80 Column Card Cat. X17025 \$95
Speech Card Cat. X17031 \$85



IBM CARDS
Multifunction Card (384K RAM) \$429
Disk Controller Card \$149
Hard Disk Controller Card \$399
Hercules Graphics Card \$249
512K RAM Card (inc RAM) \$399



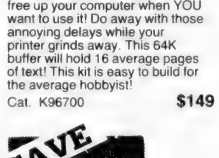
SUPPRESSION FILTER
● Suppresses over a wide frequency range 100Hz to 50MHz
● Incorporates voltage dependent transient suppression device
● Ideal for word processors, personal computers etc. Will also suppress interference on audio and video equipment
● Voltage drop on full load 1.5 volts
● Earth leakage at 250V 50Hz is 0.35mA
● DC resistance 50 milliohms - series inductance 3.5mH
● Current rating 6 amps at 250V-50Hz
Cat. X10094 \$39.95



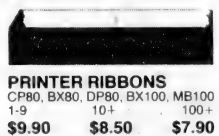
MAINS MUFFLER
Sudden mains disturbances can seriously affect your computer equipment, and stored data. Why risk it, when you can have a Mains Muffler, particularly when the cost of one failure is likely to be greater than the purchase price!
Specification:
Maximum total load: 1000w 4 AMP 250v 50Hz
First Stage- Single PI Section Attenuation: 150KHz - 40dB 500 KHz - 65dB 10 KHz - 80dB
Second Stage- Dual T. Section Attenuation: 150KHz - 20dB 500 KHz - 60dB 10 KHz - 70dB
VDR Transient Suppression Surge capacity 2000 AMP 8x20 uS
Cat. X10090 \$249



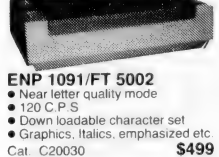
NEW! 64K PRINTER BUFFER KIT!
This kit, available exclusively from Rod Irving Electronics, is the ideal way to free up your computer when YOU want to use it! Do away with those annoying delays while your printer grinds away. This 64K buffer will hold 16 average pages of text! This kit is easy to build for the average hobbyist!
Cat. K96700 \$149



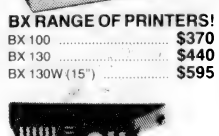
IC SPECIALS!
1-9 10+ 100+
4116 \$1.80 \$1.70 \$1.60
4164 \$2.50 \$2.25 \$1.95
2716 \$5.90 \$5.50 \$5.50
2732 \$6.25 \$5.95 \$5.50
2764 \$8.25 \$7.95 \$6.00
27128 \$12.50 \$11.50 \$7.50
6116 \$2.75 \$2.50 \$2.25
41256 \$9.00 \$8.00 \$7.50
62648 \$19.50 \$17.50 \$14.00



PRINTER RIBBONS
CP80, BX80, DP80, BX100, MB100
1-9 10+ 100+
\$9.90 \$8.50 \$7.90



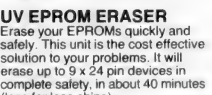
ENP 1091/FT 5002
● Near letter quality mode
● 120 C.P.S.
● Down loadable character set
● Graphics, Italics, emphasized etc.
Cat. C20030 \$499



BX RANGE OF PRINTERS!
BX 100 \$370
BX 130 \$440
BX 130W (15") \$595



"IBM TYPE" COMPUTER CASING
Give your kit computer a totally professional appearance with one of these "IBM type" casings. Includes room for 2 5 1/4 inch disk drives and connection ports. Dimensions 49x39x14cm
Cat. X11090 \$119



UV EPROM ERASER
Erase your EPROMs quickly and safely. This unit is the cost effective solution to your problems. It will erase up to 9 x 24 pin devices in complete safety, in about 40 minutes (less for less chips).
Features include:
● Erase up to 9 chips at a time
● Chip drawer has conductive foam pad
● Mains powered
● High UV intensity at chip surface ensures EPROMs are thoroughly erased
● Engineered to prevent UV exposure
● Long life UV tube
● Dimensions 217 x 80 x 68mm
● Weight 670 grams
Cat. \$89.50



5 1/4" FLOPPY DISK SPECIALS!
XIDEX 1-9 10+
S/D/D \$31.00 \$29.00
Cat. C12401
D/S/D \$38.00 \$36.50
Cat. C12410
VERBATIM DATALIFE S/D/D \$27.95 \$26.95
Cat. C12501
D/D/D \$39.95 \$37.95
Cat. C12504
VERBATIM VALULIFE S/D/D \$24.95 \$22.95
Cat. C12421
D/D/D \$31.95 \$29.95
Cat. C12425

PLEASE NOTE
NEW MAIL ORDER
PHONE NUMBER

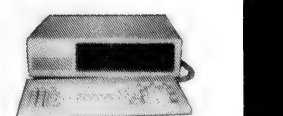


ROD IRVING ELECTRONICS
425 High Street, NORTHCOE, 3070 VICTORIA, AUSTRALIA
Phone (03) 489 8866
48 A Beckett St. MELBOURNE, 3000 VICTORIA, AUSTRALIA
Ph. (03) 663 6151
Mail Order and correspondence: P.O. Box 620, CLAYTON 3168
TELEX: AA 151938



MAIL ORDER HOTLINE
(03) 543 7877
(2 lines)

POSTAGE RATES
\$1-\$9.99 \$2.00
\$10-\$24.99 \$3.00
\$25-\$49.99 \$4.00
\$50-\$99.99 \$5.00
\$100-\$199 \$7.50
\$200-\$499 \$10.00
\$500 plus \$12.50
This is for basic postage only. Comet Road freight, bulky and fragile items will be charged at different rates.
Certified Post for orders over \$100 included "free!"
Registered Post for orders over \$200 included "free!"



IBM* COMPATIBLE COMPUTER
Incredible deals to suit everyone! All include colour graphics card, multi function card, disk controller card, 2 serial and 1 parallel ports. Your choice of 256K or 640K and the option of our special "package deals", which include a 120 C.P.S. printer and a monochrome monitor, all available at incredible prices including a 3 month warranty!
256K \$1,950
256K package deal \$2,400
640K \$2,100
640K package deal \$2,500
*IBM is a registered trademark.



COMPUTER CASSETTES
Quality 20 minute tapes
Cat. D11141
1-9 10+ 100+
\$1.50 \$1.40 \$1.20

Bankcard Visa MasterCard Signature Name Address P.Code X 1065

Exp. Date

NASA has one shot to Jupiter



NASA MONO/DPS

er. They'll go with dBASE III.

NASA has only one shot at Jupiter with Project Galileo, so there's no room for error. The purpose of the project is nothing less than to find out the origin of the solar system and seek the answer to the nature and origin of life itself.

Galileo's success is all in the timing, and that's where dBASE III™ from Ashton-Tate™ takes control. dBASE III tracks the details of the sequence of launch events.

dBASE III was easy to bring on board. It's powerful (one billion records) and has a built in programming language that has been taught to

peak "Galileo." dBASE III deals with the complex test details for Galileo as easily as it will deal with the complex details of your business for you.

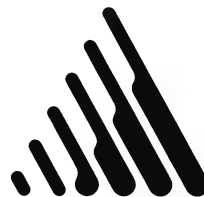


When you've only got one shot at getting something right, you need the most powerful and popular data management system on Earth . . . or Jupiter.

For a dealer near you call the master distributor, ARCOM Pacific (07) 52 9522.

Or contact any reputable computer retailer.

dBASE III. The data management standard.



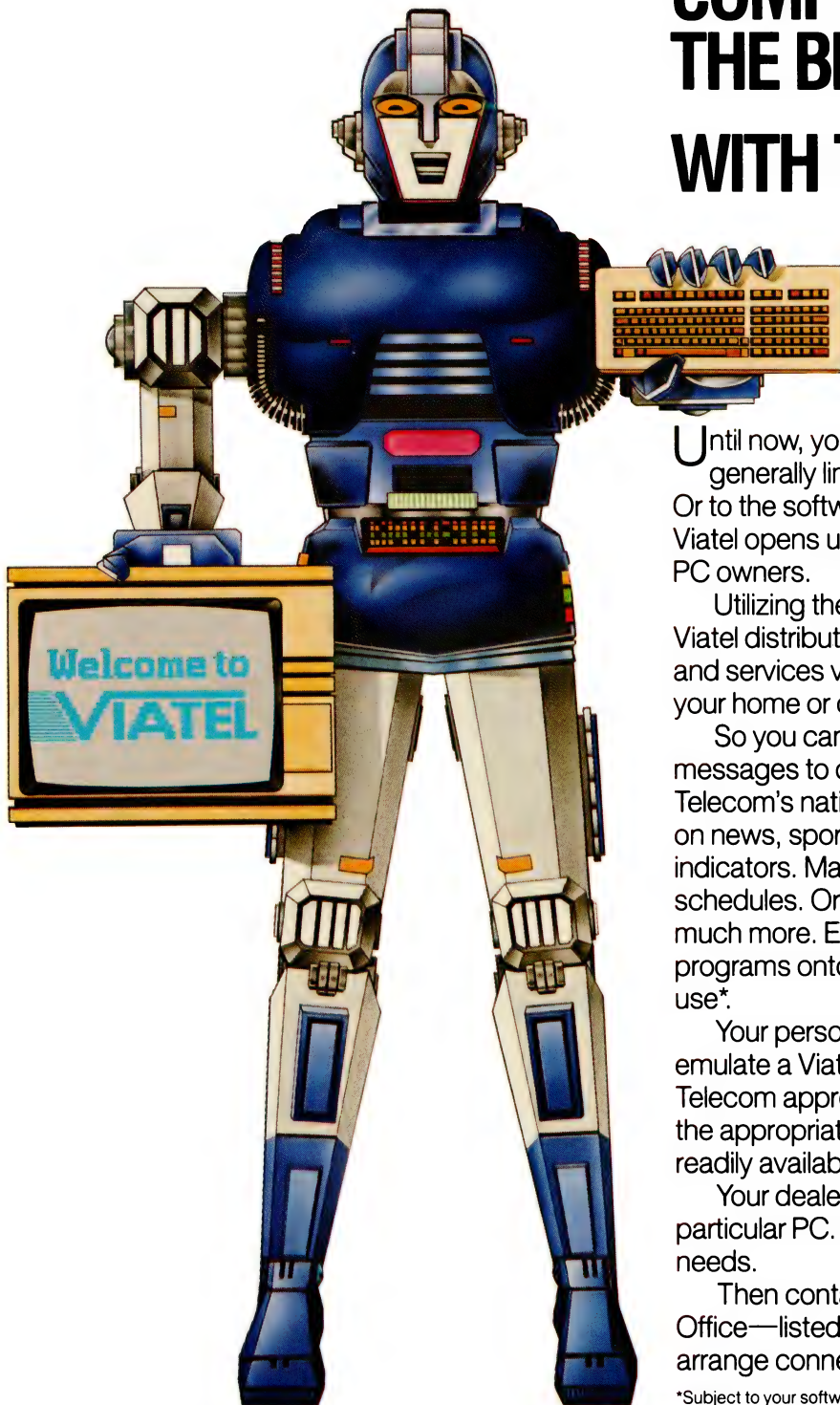
ASHTON-TATE
S O F T W A R E

distributed by

AUSTRALIA'S LEADING SOFTWARE DISTRIBUTOR

arcom *pacific*
BRISBANE MELBOURNE SYDNEY HAMILTON (NZ)

TAKE YOUR PERSONAL COMPUTER OUT INTO THE BIG WIDE WORLD. WITH TELECOM VIATEL.



Until now, your personal computer was generally limited to your information input. Or to the software available. Now Telecom Viatel opens up a whole new world for PC owners.

Utilizing the existing telephone network, Viatel distributes a wide range of information and services via a central computer. Direct to your home or office.

So you can bank from home. Send messages to other Viatel users. Access Telecom's national Telex network. Get updates on news, sport and weather. Follow economic indicators. Make bookings. Check airline schedules. Order goods. Play games. And much more. Even download new computer programs onto disk or cassette for your own use*.

Your personal computer can be adapted to emulate a Viatel terminal. All you need are a Telecom approved 1200/75 baud modem and the appropriate software. These are now readily available for most PC's.

Your dealer will know what is best for your particular PC. Talk to him first about your needs.

Then contact your local Telecom Business Office—listed in your Telephone Directory—to arrange connection to Telecom Viatel.

*Subject to your software configuration.

Telecom

VIATEL®

AUSTRALIA'S NATIONAL VIDEOTEX SERVICE



Telecom Australia
Better for Business

GOSH! HOW FRUSTRATING!

Our revered leader, Matt Whelan, asked our intrepid editor Natalie Filatoff to investigate the communications scene from a newcomer's point of view, as it's a pretty intimidating field to get going in. Nat found it something of a battlefield, with plenty of setbacks and routs, but always with that tantalising carrot of victory dangling somewhere just beyond the reach of her questing nose ...

Noncomm Nat, that's me, or so I thought after having spent my first few hours reconnoitring the data communications jungle. "Impenetrable", I was ready to report to my CO. Pockets of resistance? Ha! Their defences were impregnable ... Well, maybe there were a few chinks in the armour, but what could one tiny combatant like me do against such monstrous adversaries? Their mastery of psychological warfare was unparalleled: every time I advanced a few paces, their piercing war cry would shrill through the modem, everything would black out for a moment and I'd open my eyes to find the screenery had changed completely.

Disoriented (lost), I'd advance (how did I know I was advancing?) determinedly, but all the time they were shooting beams of invisible propaganda into my poor numbed brain: "You're spending too much money," they hissed, "Time is money." I'd begin thrashing about wildly and would inevitably find myself running in circles, or at a seeming dead end. Succumbing to a fit of jungle fever, I'd start to hallucinate ... if only I could stop them charging ... Telecom, charging, charging, charging ... Groping blindly, I'd push the RESET button.

It was pitiful. Every time the enemy would dump me unceremoniously back into MS-DOS, a kind of no-man's land as far as I could see. Where was my beloved CP/M? I was ready to go AWOL, surrender to the IBM Underground until I could be reunited with Bee; I was going to hurl my ammunition into the tangled undergrowth of phone wires and flee, but on reflection I wasn't even sure I'd started out with the

right ammunition. The fact was, and I had to face it, that I'd been unarmed all the time. That's right, I hadn't opened a manual, I'd been using my bare hands, relying on intuition ... and not doing too badly, if I say so myself.

Data communications isn't quite such a hostile environment as my frenzied state had me believe at times, but the majority of people seem to encounter a whole platoon of frustrating situations when making their first forays into the field. In many cases, these frustrations can be related to a user not being familiar with the equipment he or she is using, or with the principles behind that equipment ...

Fitting Together the Pieces

I was the prime example. I wrote this story from home, where I usually have a Microbee set up with a Beemodem and Telcom communications software, with which I have successfully sent several stories to the office over the phone lines. I didn't exactly understand how it all worked, but was gradually piecing the datacomms picture together. I was really looking forward to writing this article when the CO said he needed to borrow the Bee, couldn't I take the Olivetti home instead? I was gleeful; I've always admired the M24 from afar, but had never even had the time to run my fingers over its stylish keyboard.

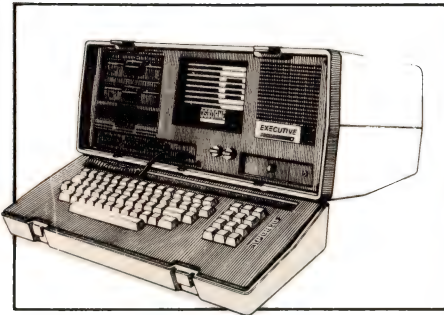
So there I was, with an unfamiliar machine, running MS-DOS instead of CP/M, using PC-Talk instead of Telcom, and wondering how I, the noncomm, was going to attach a telephone receiver to Data Netcomm's PC In/Modem so it could function as a *real* modem was supposed to. I'd had a

five-minute briefing from Whelan (the CO in question), who might well find himself in a court-martial situation when he gets back from holidays, and was busting to dive right in and attack Viatel, for starters; to get in under all those umbrellas and things I'd been hearing about, and find out just what the IPs (information providers) were up to.

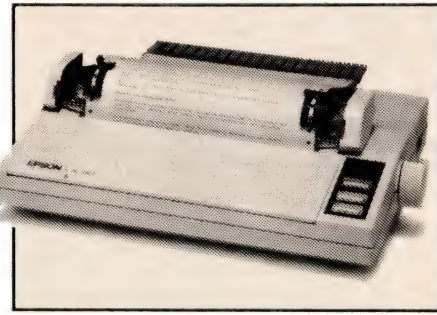
Beginners to computing should beware of seriously damaging their morale by parachuting into the telephone wires without at least acquainting themselves with the contents of their survival pack and the whereabouts of the ripcord. That's what Rose Vines told me after I'd been at it for a couple of evenings, but she put it in terms of having a reasonable knowledge of the operating system you're using, and knowing the different methods of summoning help when soldiering along in remote corners of datacomms territory; firing flares won't improve your position, nor endear you to the people who live upstairs — typing a question mark or simply 'help' is probably the preferred course of action.

The thing is, people like Rose aren't generally around when you find you've marched yourself right into a swamp, and that's the ironic twist to the datacomms attraction: data communications brings all sorts of facilities you'd normally have to go out or telephone for (most often in business hours) within easy reach of you and your home or office computer, at all times of day. You can carry out tasks by yourself, when you feel like it, and communicate with other people without actually having to 'bother' them right there and then ... but, of course, the very independence and ►

Only ONE computer system in Australia can do all this.



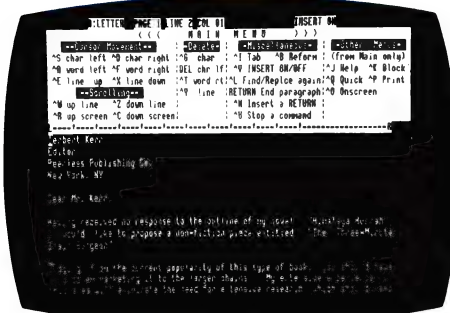
EXECUTIVE 200 COMPUTER



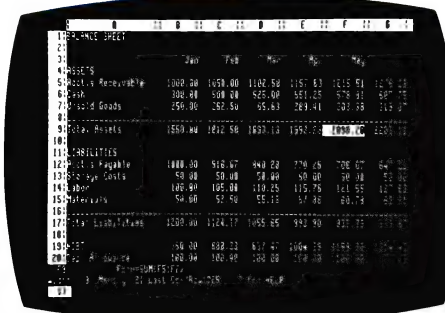
EPSON LX-80 NLQ



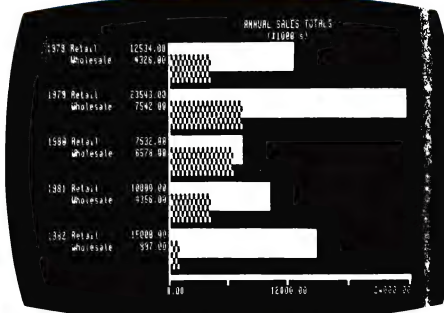
PERSONAL PEARL DATABASE



WORDSTAR 3.3



SUPERCALC 2



AUSTRALIAN CASHBOOK +

All this **FOR JUST \$3,200**

THE COMPUTER

Osborne EXECUTIVE 200 192k Bank switched RAM Dual floppy Disk Drives Hi-res built-in Amber Display with ext. video jack
24 lines x 80 characters
Full business keyboard with separate numeric pad
Two RS232 ports, one centronics
Weather resistant, portable housing
Advanced CP/M+ Operating System

THE PRINTER

EPSON LX-80
100 char. per second
Bidirectional logic seeking
Programmable line spacing
Near Letter Quality
Touch selectable type faces

BONUS **BONUS** **BONUS**
Every PC includes a **FREE** 1 year subscription to Your Computer Magazine.

1,024 byte input buffer
Epson ESC/P standard
Full down loadable character set
Bit image & graphic modes

THE SOFTWARE

CPM Plus 3.0
UCSD p-System
Wordstar
Mailmerge
Supercalc
Personal Pearl Database
CBASIC
MBASIC
CASHBOOK Plus: Cashflow Management & Accounting for you & your business

THE COMPANY. Osborne spawned the dawn of personal microcomputing in 1979 with the world's first *affordable* system. There are now some 200,000 Osborne owners in over 80 countries; over 12,000 in Australia. Osborne gives you this experience,

this reliability and should it ever occur, we give you SIX months warranty and backup support Australia-wide from Hills Industries.

THE EXECUTIVE BUSINESS PACK

FROM

OSBORNE

Available NOW from these dealers:

The Osborne Shop, Caringbah NSW — 524-6240

The Osborne Shop, Wollongong NSW — (042) 29-6822

Data Parts, Throughout Victoria, Wagga and Albury
Landlink, Tamworth & Gunnedah, NSW

Amity Computers, Albany WA
Country Soft, Victoria Park WA
Computer Sales & Leasing, Casuarina NT

and all authorised Osborne dealers

OSBORNE AUSTRALIA 93 York St., Sydney (02) 290 1122 Telex 70510, Fax 290-1558

accessibility of the thing means you'll frequently find yourself alone at the most hair-tearing, can't-get-any-further, don't-remember-how-to-go-back moments.

There you'll be, standing outside the biggest library you've ever imagined, on some remote database like the Source, without any idea how the swinging doors work; there's no sign of a librarian, you desperately need to research some obscure subject, and it's costing you a fortune in phone charges just to hop up and down frustratedly on the pavement. Or you want to juggle the money in your three bank accounts, so the right amount will be in the right place when your mortgage payment is automatically deducted on Monday — you can do it while breakfasting on Sunday, with your croissant in one hand and the *Weekend Australian* keeping your knees warm while you access Telebank through Viatel, but there won't be a teller to help you with the transfer. Or, it's I am and you need to get an electronic letter to someone so it'll be on their screen when they come to work in the morning — you won't find a postmaster to help you with the postcode, or to tell you whether you should use priority paid (1200 baud) or ordinary delivery (300 baud) in order to get it to the right mailbox safely and on time.

Remember the Novices ...

Of course, when data communications matures a little more, you probably won't have to keep looking around for a helping hand (and it probably won't be as much of an adventure as now). One aspect of the field, which becomes very clear after you've moseyed around some, is that the people providing the facilities, especially in Australia, are not yet catering for the fact that their services *are* being accessed by independent and often inexperienced users.

I enjoyed using Teledata; the screens and command card gave me all the help I needed, and knowing what my manoeuvres were going to cost and that the charges weren't exorbitant was very soothing.

They aren't yet shooting out, to your remote, island-like screen, all the information you need in order to achieve your objectives smoothly. There is a special art to presenting information on computer, and you'll know when you're in the hands of someone with skill.

I discovered one great talent during the course of my infiltration of remote computer facilities: the author of PC-Talk, who created what I think is a brilliant piece of public domainery. PC-Talk is written for the IBM PC and compatibles, and enables you to do some really sensible things, like save to disk the screens you're viewing so you can look at them more closely later — when it's *not* costing you a fortune in phone bills. I never once wished for documentation of this program; after I'd been told how to summon it at the MS-DOS prompt, our relationship was clear and we were inseparable.

Altered Objectives

Now, the original objective of this article was to gather as much intelligence as I

could on various outposts of data communications, and report to you and the CO (grr) on what it was like to access them and what they had to offer. As you're probably aware by now, I encountered a few obstacles along the way. You'll hear about the obstacles in a minute, but I'll say right now that as soon as I found a service I could get into, I stuck with it, partly because I was so glad to find something easily accessible, and partly, as you'll discover when foraging yourself, because it's virtually impossible to do a quick exploration of a sizeable facility — once you get the hang of it you want to poke into every nook and cranny.

Having conferred with the CO on my field handset, we decided there was room for more regular articles on what's going on in communications facilities both here and overseas — so look out for them in future issues, and I'll stick to general comments here.

First, the disappointments. As I mentioned above, I was really keen to have a look around Viatel. About two months before I wrote this article my spouse (organiser of all things) applied to Viatel for a subscription. At the time of writing we'd had no response, so I asked a friend if I could use his number and password. Unfortunately, the friend lives interstate, so while borrowing his electronic dog tags was no problem, I couldn't get hold of any documentation in a hurry.

Viatel is not a good proposition unless you have that documentation. Although I got in all right, I quickly pushed myself into corners, or found myself running around in circles and paying for the same screens again and again (some areas of Viatel charge you, screen by screen, to view their information). Since I was logged in under someone else's name, I wasn't keen to run up unnecessary charges, and because

Figure 1. The Mi-Computer Club Bulletin Board's opening screen.

```
(Note: the prompting bell has been disabled).

What is your FIRST name ?ratlee
What is your LAST name ?battletop
Checking user file...

Logging RATLEE BATTLETOP to disk...

You are caller # : 2223

Type HELP at the CP/M "0A>" prompt for assistance, or BOARD
to enter the bulletin board subsystem.

If you experience any problems, feel free to leave comments,
criticisms and suggestions via PMAIL to member number 1.

Want latest system information before entering CP/M ? yes
```

Figure 2.

```
Micc BB QUICK COMMAND SUMMARY

To get help on the Mi Computer Club.....HELP CLUB
To get help on joining the bulletin board.....HELP JOIN
To get help on the message subsystem.....HELP BOARD
To get help on the communications software.....HELP MODEM
To see what's on a disk.....DIR
To leave the system.....BYE
To see if the SYSOP is around.....CHAT
To read or leave messages.....BOARD
To enter the communications program.....XYAM
To read the programs (from within XYAM).....LIST or TYPE

++ See HELP THIS-SYS for more detailed information ++

+ End of Category + Type CTRL-C=CP/M, <CR>=Next Category -
```


there was no obvious and polite way to get out of some areas, I'd end up pushing the Olivetti's RESET button — a course of action which makes me feel like a real dummy.

So I'll refrain from commenting on Viatel until the means for understanding its protocols are provided (hint, hint). Since you're unlikely to try to access the facility in a similarly unprepared fashion, you shouldn't let my experiences turn you off.

Now for some Good News

They turned me off. Disheartened, I thought I'd try some familiar ground and see what *Your Computer's* Mi-Computer Bulletin Board could offer. My first, second, third, fourth, fifth, sixth, seventh (get the picture?) mistake was to try ringing it after hours — the line is almost always busy (the CO and sysop hope to do something about maybe getting multiple lines soon).

When I finally did worm my way in between other callers, I found procedures very simple. "How many nulls do you need?" asked the system. I knew, because the CO had told me once in the deep dark past, that my answer to this should be a zero. Could my computer display lower case? was the next question — of course, the Olivetti can do anything (sorry, Bee). What was my first name? Last name? The system checked to see if it had a dossier on me (luckily I had used an undercover identity). Zappo, we were into a friendly and immediately instructive opening screen (see Figure 1). I chose to look at the latest system info before entering CP/M and found a cheery message from the CO (boy, was I glad to see him): typing 'help' would get me help, Rose Vines is the sysop, she'd been doing a lot of cleaning up, the hard disk was going to be up again soon, and so on.

Figure 3. The Entertainment Connection menu.

```

EI3  Info Menu      EI32 System News
EI33 Industry News  EI35 Magazine
EI36 Directory      EI4  Bboards
MAIN Teledata Menu  HELP Help Menu

Last Paragraph: 3
SEL(File) : MAIN
    
```

I humbly typed 'help' and got a menu of things I could ask for help with (see Figure 2). HELP CLUB was first, which told me the Mi-Computer Club was defunct, and that the bulletin board was the only remaining part of it. I knew that already, so I typed HELP IOIN and got the details you would

Figure 4. Teledata's main menu.

```

--< THE TELEDATA NETWORK >--
-----
1 . What's New ? (09-Aug-85)
2 . International GateWay Services
3 . Personal Computing & Leisure
4 . Entertainment & News Services
5 . Telex & Communication Services
6 . The Shopping Complex
7 . Subscriber Comments & Feedback
8 . Membership Information Guide
9 . Network Information Guide
10. Signing Off

SEL( ) :
    
```

Figure 5.

```

MEMBERSHIP INFORMATION GUIDE
-----
1 . Subscriber Rates & Fees
2 . Accounting Information
3 . Your Account Balance & Details
4 . Changing Your Username
5 . Changing Your Password
6 . Membership Regulations 1-JUL-85

SEL( ) :
    
```

have read in Rose's 'Bulletin Board Backchat' article.

Next was BOARD, and being an unfinancial member — that is, a visitor — I picked the 'Visitors' section. This informed me that, unfortunately, I couldn't access the pocket programs, and I subsequently sus-

pected I wouldn't be able to use the mail facilities, either. I tried the 'Personal Messages' option and, sure enough, mail was only for people with money upfront. This screen also told me to beware of leaving anything truly confidential on the bulletin board, since although the system is fairly secure, an "inventive system-breaker", might be able to get in.

Just one more from the BOARD menu: it had to be the intriguingly sinister option, 'Killing Messages', which proffered the following: "Ideally, the sysop should never have to delete your messages. You should be doing so yourself on a regular basis, once you think they've been up for long enough to serve their purpose ... often we only look at recent messages when we log on and forget the historical gems we entered weeks or months before."

I knew Rose wasn't there, but I typed CHAT (to talk to the system operator) out of curiosity. The system politely informed me that it would see if someone was available, and would return to me in 30 seconds if they weren't. It beeped and dotted me through those 30 seconds, to let me know it was trying all the time, and then apologised for the lack of response.

Only having 'visitor' status was terribly

Figure 6.

```

SUBSCRIBER RATES & FEES
-----

When you logoff from the system, you
will be informed of the charges
incurred during that session, broken
down into various categories.

(i) Weekdays:  0000 - 0800 $ 5.00/hour
                  0800 - 1800 $13.00/hour
                  1800 - 2400 $ 8.00/hour

(ii) Weekends/National Public Holidays
                  0000 - 1800 $ 5.00/hour
                  1800 - 2400 $ 8.00/hour

Note : National Public Holidays denotes
a Public Holiday in ALL states!
A connection fee of 33 cents (the price
of a stamp!) is charged each time a
member logs on. The member is also
charged a minimum time charge of 40
cents each time the member uses the
system. This means that if you use LESS
than 40 cents of time on the system you
will be charged a minimum of 40 cents.
However, if you used 50 cents worth of
time, you would ONLY be charged 50
cents.

DISK STORAGE CHARGES
-----

Each member is charged a quarter of a
cent (0.0025) per kilobyte per day, for
items stored in their private DIRECTORY
or storage area.

ACCOUNT MAINTENANCE FEE
-----

People who were members of the system
    
```

prior to 30th June, 1985 and Home/Student members are charged an Account Maintenance fee of \$2.00 per month to cover the costs of maintaining their data on the system.

Commercial members are charged a fee of \$5.00 per month but are not charged a surcharge for access to purely commercial applications on the system.

EXTERNAL CHARGES

These are the charges imposed by Telecom and O.T.C. for the use of their facilities plus a small T.A.B handling charge for Telexes, and are payable in ADDITION to Teledata hourly rates.

Austpac Charges (Telecom):

```

0800 - 1800 $5.95/hour
1800 - 0800 $4.95/hour
All Weekends $4.95/hour
    
```

Telex Charges:

```

National (Telecom)
0800 - 1800 $0.45 per minute
1800 - 0800 $0.25 per minute
    
```

```

International (O.T.C.)
$2.00 per minute
    
```

The Telex network transmits characters at a rate of approximately 5 characters per second.

```

Paragraph: 18 0% left.
SEL(File)/C:
    
```

Figure 7.

```

BREAKDOWN OF ACCOUNT
=====
CURRENT MONTH : $    20.70
TOTAL          : $    20.70
=====

MAXIMUM ALLOWED ON SYSTEM
=====
TOTAL TIME USE : $    500.00
SINGLE PURCHASE : $    500.00
TOTAL PURCHASES : $    500.00
    
```

annoying — I couldn't really *do* anything. I now understand all those extremely impatient-sounding people who ring our office wanting to become members of the board right away. What's \$20 when you can find out what lies behind all those menus?

Aside from this one frustration, our bulletin board seems very easy to use. I never felt out of control, because the screen in front of me always suggested what I might do next, and I'd been informed from the start how to get help if I needed it. (If Viatel had employed similar methods I wouldn't have required a manual.)

Logging off, I was given the chance to leave a comment. Overjoyed, I typed a long, friendly message to Rose.

The most pleasurable thing about data communications really is communicating. At *Your Computer* we've always been able to send mail electronically between terminals. Each time you log on the system tells you whether you have 'mail'. It's most useful when someone is out and you want to leave them a message, or when someone looks depressed and you want to cheer them up, or when someone has a birthday, or ... it's just most useful. The CO often works on the company's systems late at night and tends to write us swags of mail while he's waiting for disks to format and the like — the mail program tells you when each message was written, so we can generally tell from how late the message was sent when to expect our leader to front up the next day, and how sympathetic we should be. Obviously, electronic mail has

Figure 8.

```

Time Charges:

EVENING:      28 Minutes $    3.73
LOGON:  Connection Fee      $    0.33
-----
TOTAL:        28 Minutes $    4.06
AUSTPAC CHARGE:      2.31
Press RETURN to logoff ...
    
```

many other useful applications, both within and between computer systems.

Most communications facilities support messaging, either to users of the facility in general (advertisement sections, noticeboards, and so on), or to specific users (member to member or member to sysop). Cathy Gray, editor of *Sonics*, one of our sister publications, subscribes to Teledata, a communications facility which, among other things, offers an area devoted entirely to the entertainment industry.

Figure 9.

```

PERSONAL COMPUTING AND LEISURE
=====
1. Special Interest Bulletin Boards
2. Group and Club Announcements
3. Private/Restricted Menus
4. The Amusement Arcade
5. Teledata Green Pages
6. CompuNews Online Magazine
7. Topic Of The Month
8. Dear Auntie Frank Personal Column
9. CompuMart - Computer Flea Market
10. Trading Post - General Items
11. Fun & Games Joke Column
12. Community Services

SEL( ) :
    
```

Yay, Teledata!

Teledata was the first unfamiliar system I had no trouble accessing and finding my way around in. The CO had supplied me with a command card, without which I wouldn't have been able to move about with as much confidence as I did.

Teledata is accessed through Austpac, Telecom's packet-switching network. So I dialled the Austpac number from within PC-Talk, which put the call through the modem. After the carrier signal had shrilled, I was required to type in the Teledata 'address' number, and could then sign on and give Cathy's password ... several times, because I couldn't remember the right combination of letters and spaces — lucky Teledata allows for that.

Since I was using Cathy's password, the system logged me straight into the 'Entertainment Connection' area (see Figure 3), but I immediately had the option of transferring to Teledata's main menu. From the main menu (Figure 4), I chose to view the Membership Information Guide (Figure 5a), and then, still jittery about how much money Telecom was making out of all this, I thought I'd better have a look at subscriber Rates and Fees. You can see how reasonable the charges are in Figure 6. I thought it particularly civilised that the bill includes Austpac charges, and that it is broken down into its various components.

Figure 10.

```

--< TOPIC OF THE MONTH >--
=====
1. Jan '85 - Life After Death ?
2. Apr '85 - Queensland Politics
3. May '85 - Animal Research
4. June '85 - World Government Y/N?
5. July '85 - Terrorism
6. Aug '85 - Unionism

SEL( ) :
    
```

I had a look at Cathy's 'Account Balance and Details' (Figure 7): over \$450 to go before I busted her credit limit — I was getting bolder.

I considered changing her password (option 5 in Figure 5), so only I could get in in future. She'd have to beg me, pay me a king's ransom in coffee beans (*Your Computer* currency) before I'd tell her the new one

While I was plotting deviously, Teledata logged me out because I hadn't hit a key for over five minutes. It politely informed me (Figure 8) of the bill I'd run up — \$4.06 for 28 minutes — and invited me to press return in order to complete my retreat. I did.

Logging in again the next day I thought I'd go for some relaxation, so I chose 'Personal Computing and Leisure' from the main menu (see Figure 9), and sauntered into the Amusement Arcade. A game of Tic-Tac-Toe sounded like something I could cope with, but I couldn't get the instructions to stop scrolling past me for long enough to read them. Lost that game, obviously.

Going to the Teledata Green Pages, I had the same problem with information on Andy's Plumbing Service. Whoosh — that was one swift plumber.

Figure 11.

```

Shoot the do-gooders
=====
Page Created: 00:08 08/07/85

Notice we don't hear of terrorism in Russia? Why not let us get tough too! That's all these people understand! If we're not going to carry out our threats of reprisals we shouldn't make them. Extend the same treatment to our own local trade union terrorists; we pay taxes so police & military can protect us, then remove their powers to deal with law-breakers because we listen to the do-gooders. If the bible-bashers believe their ravings, we'll actually be doing them a service by helping them into the next world!
    
```

Ambling through the Computer Flea Market, I couldn't find anything that would pass as a welcome home present for my Bee. It was good to see people had taken ▶

different approaches to advertising their wares; one user tried the tantalising tactic of making users scroll through a couple of blank screens between the description of what he wanted to sell and the price.

What was the Topic of the Month (Figure 10)? They hadn't got to September yet (it was still the beginning of the month when I was doing this research), so I chose to look at July's topic which was 'Terrorism'. The sub-menu was fascinating. Feeling perverse, I thought I'd look at 'Shoot the Do-Gooders' (see Figure 11) — wow. 'Be Gentle, But Be Forceful', seemed like it might express a more sit-on-the-fence attitude: it did. This forum-type arrangement (at least that's what I assumed I was looking at, in the absence of any explanation) was intriguing. How could I find out the September topic and maybe get rid of some frustrations myself? I never found out.

What about the Dear Aunty Frank Personal Column (see Figure 12)? It was too good to miss. 'Marooned' was what I wanted to be; perhaps someone had written in to say they were sick of their solitary island paradise, would someone in the Teledata audience like to take over? No such luck. I thought 'Why Don't I Get Anywhere' might expose someone's sordid problem, but it was something to do with their car being sluggish off the lights in wet weather. I was beginning to think Aunty Frank wrote most of her letters herself.

By this time, I had spent many minutes on Teledata, and seeing on my command card that typing STATEMENT would give me an account balance, I thought I'd check out the damage. But it only offered me the bill as it stood at the end of yesterday's communication. Oh well, there was lots more to see. At this stage I felt I was ready to digest some more sensible data and selected the 'Network Information Guide' and a dose of 'The History of Teledata'.

"The Teledata Network," said the screen, "was originally incorporated in October 1981, and whilst trading as 'The Australian Beginning', first made facilities available to members in March 1982 ... In April 1985, ownership of the company changed ... On July 1st, 1985, after a period of negotiation and redevelopment, the service was re-launched as Teledata ... It is currently the only network in Australia offering services similar to those of its counterparts in the United States — Compuserve, the Source and Delphi."

A Who's Who of Teledata gave me "a listing designed to allow users to contact

Figure 12.

```

Dear Aunty Frank
-----
1 . General Information
2 . @ What will I do?
3 . @ Beauty Advice Please!
4 . @ Nail Biting.
5 . @ Travel Without Money?
6 . @ Too Many Women is my Problem!
7 . @ MAROONED!
8 . @ BABEL FISH!
9 . @ LOST TOWEL!
10 . @ Strange Little Box
11 . @ CATS WANTED!
12 . @ Where Have My Goldfish Gone??!!
13 . @ OUCH!
14 . @ Why Don't I Get Anywhere?
15 . @ Please?
16 . @ GARDEN ORNAMENT!
17 . @ I HAVE A HANGNAIL PROBLEM!
18 . @ LISP
19 . @ WHAT HAS THE DONKEY GOT?
20 . @ BEDHEAD WANTED

SEL( )/C:
    
```

Figure 13

```

--< The Shopping Complex >--
-----
1 . Your Rights and Responsibilities
2 . How to Shop on Teledata
3 . The Teledata Shop (Closed)
4 . The Book and Magazine Centre
5 . The Computer Centre
6 . The Software House
7 . The Modem House
8 . The Electronic Editing Service
9 . The Electronic Art Gallery
10 . Wendy's Gift Fruit Baskets Store
    
```

Figure 14.

```

NEWS & INFORMATION (E13 )
-----
1 . Introduction - News & Info
2 . System News
3 . Industry News
4 . New Products & Services
5 . Online Magazine
6 . Directory

SEL( ) :
    
```

Figure 15.

```

1 . Introduction
2 . Audio & Sound Reinforcement
3 . Recording & Broadcasting
4 . Video, TV and Film
5 . Performing
6 . Lighting
7 . Employment
8 . Trading Post
9 . Midi
10 . AES
11 . IREE
12 . Jokes

SEL( ) : 12
    
```

other users on the system who may be able to offer help in some area, until we (Teledata) establish an on-line 'Users Directory'."

The 'Gateway Services' option told of interesting things to come: "Teledata is at present developing a number of Gateway links to various on-line information databases, electronic mail services and computer networks throughout Australia and the world." This will apparently enable Tele-

data subscribers to do virtually all their communications dialling through the one service, and maybe be billed for everything through Teledata's neatly organised system.

Shopkeepers can see her coming...

Then my gaze landed on the 'Shopping' (see Figure 13) option again, and this time I couldn't resist. I read the guff about rights and responsibilities and grew impatient over the how-tos, but finally I was there. Book browsing seemed a good idea, but the Holt-Saunders Bookshop had nothing to improve the mind of my Bee.

The Software House was sure to have just the thing, so I entered boldly. Hmm, Acme was a well-known brand — I asked to peruse its range. Home Budget sounded like the sort of thing I should be interested in, but unfortunately, the salesperson refused to give me any details of which computers it would run on (what was I saying about inadequate information?).

Despairing, I turned to food; I was hoping to find something unhealthy in Wendy's Gift Fruit Baskets. Sure enough, I could get chocolate eggs at Easter, stuffed toys too, and most other things that would fit in a basket. But, curses, Wendy only delivers in the Melbourne metropolitan area — the CO was going to be in Melbourne for two days ... why not send him a surprise? Wendy's last information frame let me down — I had to tell Teledata I wanted to place an order, they'd let Wendy know, and she'd contact me. Well, they didn't say how long all this was likely to take, so I decided not to take the risk ...

I'm a determined shopper, so I tried the 'Electronic Art Gallery', which turned out to have a selection of graphically represented greetings. I purchased a Happy Birthday (gift box and tag) for 99 cents, and it was transferred (a word Teledata can't spell) to Cathy's directory.

I'd spent about two and a half hours in Teledata and clocked up \$19 towards Cathy's bill.

Keeping Up with the News

The third time I logged into Teledata, I noticed there was a lot of news for people logging on to read; it talked about what was new on Teledata, who'd won last week's competition, and so on. The only problem was that I couldn't get this news to stop scrolling past.

I decided to hang around in the Enter-



Hands up all those who'd like something out of the ordinary.

At Seiko we understand the need to break out of the mould.

For whilst we appreciate that going along with the crowd may be easy,

so, we also realise is getting lost in it.

That's why we've created a range of Seiko watches that allows you to show the world exactly who you are.

A range of sophisticated styles and designs. Where the Duo offers a dual time zone function which can be independently set.

A range so unique that it even includes a watch that follows the phases of the moon.

And that means, that even in a complete black and white world, with Seiko, you'll always stand out in the crowd.



SSB(S)/SKO/013 B



HANDS UP FOR
SEIKO

THE ENIGMATIC TULPI MODEM

APTLY BILLED AS "the intelligent modem, like no other modem", the Tulpi is something of an enigma. While it has some of the finest hardware I've seen in an Australian-made modem, the unit we tested also had a clumsy, difficult software interface.

The Tulpi is manufactured by Telecorp of Terrey Hills, Sydney. Managing Director Richard Graham is well-known in the industry as the driving force behind Osborne Australia before the collapse of Osborne Corporation in the United States. I found Telecorp's service both courteous and prompt, and have had similar reports from other Tulpi users.

The Tulpi is an impressively large modem with the box measuring 260 mm by 250 mm by 64 mm. This is larger than a standard Telecom phone and I found it tended to dominate any desk it was sitting on.

Poor Documentation

The front panel has nine visible LEDs indicating the modem's present state. When the modem is switched on these LEDs go through a test sequence in which they flash until the modem is ready to receive commands. Unfortunately, the Tulpi documentation provides only a limited explanation of what these LED indicators are for, and while the functions of Power, Online, Ring and Test should be self-evident, others like RX, TX, RTS and RLSD are likely to be mystifying to a new modem user. Another LED indicator labelled Fault isn't mentioned in the documentation, and when at the end of the test period the Tulpi refused to send anything to the computer the FAULT indicator didn't light up. A supplementary page covering the LEDs is now included in Tulpi manuals, and a new manual is said to be on the way.

There are no switches on the Tulpi, not even for power. While it doesn't consume much (only 11 watts), I'm uneasy about leaving anything electrical switched on, and found it inconvenient having to reach down to the skirting board outlet to turn the Tulpi off. (Telecorp says the Tulpi is designed to run 24 hours a day, which is why there is no switch).

A DB 25 connector with a Telecom 605 plug for the RS232C interface is on the back panel with a cable for connecting to the telephone system. A cheap pushbutton telephone with poor voice quality (since replaced with an improved unit) was connected to the Tulpi, but as this wasn't a

Should you tiptoe past the Tulpi, or pluck it? Bill Bolton wasn't sure when our review unit exhibited a few shortcomings. But the manufacturer reacted to the criticisms with the promise of an update (due out by the time you read this) which could turn it into a real winner.

telephone review I disconnected the phone from the modem and restrapped the Tulpi for normal Telecom Mode 3 operation with a Telecom phone.

The two halves of the case clip together and it took a few moments to figure out how it came apart, as (perhaps understandably) there were no instructions for accessing the internals of the modem.

The Circuitry

A superb piece of hardware engineering! The circuit board is of a high quality and is cleanly laid out with good components mounted on it. No circuit diagram of the unit was supplied.

The Tulpi uses the AMD 7910 'world' modem chip, as do most of its competitors, and this largely sets the basic operational performance parameters of the modem. The technical performance of the hardware was very good, with low distortion levels and high stability.

Telecorp claims the Tulpi has 'exclusive longline' circuitry, which means "if the line is so poor that reliable communication is impossible, longline will disconnect". As you will see, I had trouble with the Tulpi disconnecting under what I considered to be normal line circumstances, but I'm not sure whether the longline feature had anything to do with this.

The Intelligence

The intelligence is provided by an 8085

CPU with control software in EPROM (erasable programmable read-only memory). The various operating modes of the Tulpi are under software control, and it 'wakes up' into a mode programmed into the EPROM on the circuit board.

The default wake-up mode is for 1200/75 bps V.23 operation using a data format of seven data bits, one stop bit, and even parity. Telecorp will program whatever 'wake-up' you require into the EPROM for a nominal amount after purchase, or free if specified when ordering.

V.23 Modem Standard

The V.23 modem standard isn't really a full-duplex standard. It's primarily intended as a half-duplex standard, with all communication going over the same data channel. The two ends have to agree over who is sending and who is receiving at any particular time with half-duplex operation. The V.23 standard provides a 75 bps 'back channel' which is independent of the 1200 bps channel, so a form of full-duplex operation with 1200 bps in one direction and 75 bps in the other direction is possible.

Because the 75 bps channel is a 'back channel' rather than a normal full-duplex channel, an RS232C interface doesn't usually bring it out to the normal transmit and receive data pins on the interface. For a strict V.23 modem implementation you'd need a different cable to connect your computer to the modem from the one you'd use for a V.21 300 bps modem.

Another problem is that many personal computers can't 'split' the baud rates on their communications ports. On an IBM PC, for instance, there's no choice of setting the serial ports for 1200 bps operation in one direction and 75 bps in the other. You can only have the same baud rate selected for both directions of communication.

The Tulpi Buffer

The Tulpi overcomes the two problems of the RS232C pin connections and 'split' baud rate by internal buffering between the phone line and the computer interface. This means you can program the phone line communication speed to 1200/75 bps or 300/300 bps while the computer interface is programmed to operate at, say, 1200/1200 bps. The RS232C interface brings out the transmitted and received data for both 1200 bps and 300 bps operation on the normal transmit and receive

pins (pins 3 and 2 respectively).

The user can program the computer interface to operate at any speed between 75 bps and 19200 bps. Different baud rates for the transmit and receive direction as well as the phone line speed can also be programmed; the choices range from 75 bps to 1200 bps, with the modem selecting either the V.21 or V.23 modem standard as appropriate. This phone line speed selection is also used for setting whether the CCITT modem standards (V.21 and V.23) or Bell modem standards (Bell 103, 202) are used. The modem defaults to CCITT standards unless the Bell standard is specifically selected.

Obviously if the phone line speed is set to a lower value than the computer interface speed there must be some control of the flow of data or data will be lost. The Tulpi uses the Data Set Ready (DSR) line on the RS232C interface to control the flow of data from the computer to the modem. When the Tulpi has almost filled its buffer with data from the computer which has not yet been sent over the telephone line, it switches the DSR line on the RS232C interface to false. When the buffer is empty it switches the DSR line to true to tell the computer it's ready to accept more data.

This means the communications port on the computer must be set up to respond to the DSR line from the modem as a handshake signal. In a strict RS232C serial port implementation this should always be true, but some PCs won't respond to the DSR line because it's disabled in the PC hardware or the PC software isn't programmed to respond to it. XON-XOFF handshaking is also provided.

Because of the two-step procedure needed to change the speed of both the line interface and the computer interface on the Tulpi, I found it convenient to leave the computer interface set at 1200 bps and only change the speed on the phone line interface. The internal Tulpi buffer is 2 Kbytes, and although I didn't have DSR handshaking enabled on the computers I was using, I didn't have a problem with lost data when sending data to the modem at 1200 bps for transmission at 300 bps as long as I didn't type too far ahead of what was being echoed from the remote system.

When using the Christensen protocol to transfer files, the computer would only send one data block of 131 bytes at 1200 bps to the modem before waiting for a response from the remote computer, so it never came close to filling the buffer, as software handshaking was preventing data loss.

The two ends have to agree over who is sending and who is receiving at any particular time with half-duplex operation.

The Tulpi allows the data format for the computer interface (the number of data, stop and parity bits) and the data format of the phone line communications to be set quite independently. It's possible, for instance, to have the data format of the modem line set at seven data bits, one stop bit and even parity while the computer interface is set to eight data bits, one stop bit and no parity.

The Commands

The Tulpi has 12 commands for programming its operation: answer, dial, equalise, format, hangup, new, originate, private line, speed, test, unlisten and verbose. The basic operating parameters at 'wake-up' after the power is turned on are obtained from the EPROM.

The commands are sent to the computer as an attention character (which defaults to a full stop, '.') with the first letter of the command. The user can change this to any other ASCII character with the 'new' command. I didn't like the default choice of the '.', but more of that later.

A command to set 'originate' mode would look like 'O'. The command to dial the telephone number (07) 378-9530 (the Software Tools RCPM number) from an exchange which supports tone dialling would be 'D # 073789530 T'.

The command set allows most of the important operational parameters of the modem to be changed, but some are designed in and can't be altered. The command set is fairly logical; some commands will give English response messages, and if the Tulpi doesn't recognise a command it returns an 'Uh?' message (newer versions say 'Command Error').

The Gotchas

There were several aspects of the command set which created problems for me, the most serious of which concerned the 'unlisten' command. The Tulpi we tested had to be commanded to go into an unlisten mode when it went on-line; it didn't do it automatically. If you're using the default

attention character '.', and forget to set the 'unlisten' mode, you'll have problems every time you try to send a '.' character.

Telecorp is now shipping all its modems with 'unlisten' as the power-up default unless otherwise requested. That's a big improvement, but it's still not enough — once you set it to 'listen' (say to hang up from your first call) it stays in that mode next time you go on-line unless you remember to set it back.

Imagine you're entering a message into an electronic mail system and put a '.' at the end of a sentence which finishes mid-line. You then enter the next sentence starting on the same line, and when you press return to end that line the modem comes back to you with an 'Uh?' message. You go back and get the mail system to retype the last line and you find that everything after the '.' is missing. The Tulpi has interpreted everything after the '.' as a command and stored it in its internal command buffer for processing. It usually won't recognise your sentence as a command (unless you're particularly unlucky) and so just gives you the 'Uh?' response.

The solution *sounds* simple, but make sure you issue an 'unlisten' command before going on-line.

When using V.21 standard many users find phone lines will work better in one direction than in another. A phone line which is unreliable for data when the person making the call is in originate mode and the person receiving the call is in answer mode (the norm for data calls) can work fine if both ends switch modes. Some remote services, such as the Software Tools RCPM, give callers the option of 'flipping' their modem from originate to answer mode soon after logging on. (Around 25 per cent of callers to the Software Tools RCPM use this facility.)

The Tulpi can't change modem modes effectively when it's on-line. While dumb modems allow the user to change between answer and originate modes by a switch or a control line on the RS232C interface, the Tulpi requires software commands. Once it's connected to a remote modem the Tulpi will disconnect if it loses carrier. When you issue the software commands to change the Tulpi mode from originate to answer, for example, the Tulpi will lose carrier unless the modem at the other end changes mode at the same time. The window for the 'same time' seemed a lot shorter than the claimed 600 ms.

Most remote systems will tolerate a carrier loss of several seconds (Telecom reg- ▶

ulations allow a loss of up to 30 seconds before a disconnect must be forced by the answering end), which is plenty of time for a user to change the mode on a dumb modem.

The carrier loss disconnect also makes the Tulpi unsuitable for auto-answer operation on remote systems. Minor interruptions to carrier due to crosstalk, 'line hits' and other transient line phenomena are quite common in my experience with

the Australian telephone system, and may corrupt data, but are rarely severe enough to warrant automatic termination of the call.

When I tried the Tulpi in auto-answer mode on the Software Tools RCPM I got a barrage of complaints about premature disconnects from callers, and the number of unsuccessful calls reported by the communications supervisor software skyrocketed to nearly 50 per cent (it's typically

about 4 per cent).

I found it impossible to connect to several remote systems when using the Tulpi in its normal mode, while I had no trouble using other dumb and smart modems. This was because the remote system's auto-answer sequences 'glitched' carrier slightly at answer, which was enough to cause the Tulpi to disconnect.

The solution was to use the 'private line' mode, in which the Tulpi wouldn't care if it

HOW MODEMS GOT SMART

Conceived in 1977, where are Intelligent Modems at today? Bill Bolton gives us the lowdown on the Hayes 300, the de facto standard for Bell 103 'smarts'.

The concept of intelligent, or smart, modems arrived when DC Hayes Corp introduced the Smartmodem 300 to the American market in 1977. The Hayes Smartmodem 300 was a Bell 103 standard modem which could be commanded by software to auto answer, dial telephone numbers and change the number of its operating parameters. The user interface was well thought out, and over several years became a *de facto* standard for Bell 103 'smart' modems from other manufacturers.

In about 1980 Hayes introduced the Smartmodem 1200—an enhanced version of the Smartmodem 300—which could handle Bell 212A 1200 bps full-duplex communications as well as Bell 103 300 bps. Hayes expanded the command set to include a number of extra features necessary to control a dual-mode modem and added auto setting of the modem speed by sensing what baud rate the computer was using to send information to the modem over the RS232 link. The modem could also auto sense what speed an incoming call was at and tell the computer.

The expanded Hayes command set for the Smartmodem 1200 became the *de facto* standard for the 1200 bps modem market in the United States. Hayes and other manufacturers also introduced plug-in board modems for the IBM PC, which were generally similar to the 'standalone' 1200 bps products.

The Dilemma of Intelligence

The problem with intelligent modems is how to get them to distinguish be-

tween commands you want them to respond to and data you want them to send to the line. Hayes decided that to get the modem to do anything at all you'd have to ensure almost any command started with a predefined command delimiter, specified as 'AT' (for Attention). (Sometimes you'll see the Hayes command set referred to as the 'AT' command set.) After the initial 'AT' further commands are sent to program the modem.

As the letter combination 'AT' occurs in many English words, Hayes designed its modems to go into an 'unlisten' mode as soon as they actually connected to another modem.

So far so good, but what happens when you want to change a parameter of the modem when it's on-line? Hayes decided to have a period of silence followed by an 'unusual' combination of characters and another period of silence to get the modem's attention while it was on-line. After the modem received and recognised the on-line 'escape' sequence (from either end of the data link) it would again respond to AT commands (from either end of the data link). A one-second silence was followed by three '+' characters followed by another second of silence as the default on-line 'escape' sequence was selected.

Though unlikely, the '+++ sequence could occur in transmitted data, so Hayes allows the user to reprogram the escape sequence to use a different character and silence time. The main purpose of this appears to be for auto answer modems, which generally get

reprogrammed to something other than '+++' to avoid the autoanswer modem getting reprogrammed if a caller with a similar modem tries to reprogram his modem while on-line.

The Hayes command set allows fairly detailed control over the operational parameters of the modem, even down to the level of reading the modem's USART status registers. The modem can be instructed to report 'results' of certain operations in either a numeric code or English words like 'NO CARRIER' or 'CONNECT 1200'.

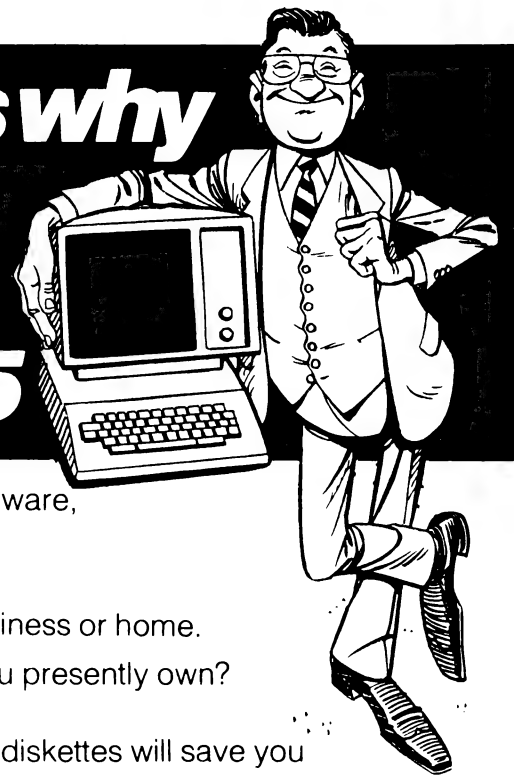
Hayes has recently introduced a Smartmodem 2400 and further extended the command set to allow control over new parameters associated with the extra facilities provided in the modem.

Command Set Support

The fact that the Hayes command set has become a firmly entrenched *de facto* standard indicates that it successfully addresses most of the needs of users.

Most communications software available for PCs assumes you are using a Hayes command set-compatible modem as its default. If you're lucky the communications software will allow you to easily redefine the modem control command sets, but still usually expects the replacement codes to have a general similarity to the Hayes set in terms of the parameters you're able to control. Many public domain programs support *only* the Hayes command set, and you have to change the program source code if you want to use a different command set. □

Five good reasons why YOU should visit the Queensland Computer Expo '85



- 1** You can see the latest technology in Computers, software, peripherals and ergonomic furniture under one roof.
- 2** Every major brand of P.C. is yours to test drive.
- 3** Get sound advice on the right computer for your business or home.
- 4** Are you getting maximum use from the computer you presently own? Ask the experts at Computer Expo '85.
- 5** Special Show discounts on hardware, software, and diskettes will save you a bundle.

The Queensland Computer Expo '85
Crest International Hotel 6th-9th November 1985

Robert Woodland
Exhibitions
Phone (07) 372 3233

SETTING A NEW STANDARD OF EXCELLENCE STEMWRITER

**World's Leading Word Processing Software for
Apple IIe, IIc, and III Personal Computers**

\$320 (incl. Tax)

- ★ Easy to use, works intuitively like you do with pencil and paper.
- ★ On-screen Underline, Overstrike, Bold, Super and Subscripts (4 nested levels).
- ★ Up to 8 documents simultaneously in Memory with split screen viewing.
- ★ Text can be Copied/Moved/Wiped by Block or Column.
- ★ Column Alignment to a defined character e.g. decimal point.
- ★ Extensive formatting capabilities with Justification Page Headers & Footers, automatic footnotes, Multi-Column (up to 4) printing
- ★ Mail/Refer: List, Standard paragraph Management including Sort/Select.
- ★ Background printing, Form Letters, and much, much more.

(MOVE) TEXT BY (BLOCK)

STEMWRITER ALLOWS YOU TO DISPLAY TWO SEPARATE DOCUMENTS OR TWO DIFFERENT PARTS OF THE SAME DOCUMENT ON THE SCREEN SIMULTANEOUSLY. CURRENTLY DOCUMENT 1 IS BEING DISPLAYED IN THE TOP HALF OF THE SCREEN IN WINDOW B. UP TO 8 DOCUMENTS (OF ARBITRARY SIZE) MAY RESIDE SIMULTANEOUSLY IN THE COMPUTER'S MEMORY. THIS MAKES IT EASY TO MOVE AND COPY TEXT FROM ONE DOCUMENT TO ANOTHER.

DOCUMENT 2 IS CURRENTLY BEING DISPLAYED IN THE BOTTOM HALF OF THE SCREEN, IN WINDOW C. COMPLEX EQUATIONS WILL APPEAR ON THE SCREEN JUST AS THEY WILL WHEN PRINTED ON PAPER (PROVIDED THAT YOUR PRINTER HAS THE CAPABILITY), E.G.

$$c_1^1 \neq k_{14}^1 c_1^1 (z_4 - c_1^1) + a_1 e^{-\beta t} - e^{-\lambda(\rho^2 - \rho_{\min})}$$

Postal Address:
G.P.O. Box 1280
BRISBANE, QLD 4001

Phone
(07) 369 1515

For a free brochure, contact us directly at Stemsoft, or see your local Apple Dealer.

Apple is a Registered Trademark of Apple Computer Inc.

FMS

Tools for Professionals

Lattice C \$770

The 16-bit C Compiler used by the experts. Early version sold as Microsoft C. Version 2.14 includes automatic sensing of the presence of 8087 chip, Unix-compatible maths functions, and more.

Lifeboat's Run \$309.00

C Interpreter. Perfect for learning or teaching C and debugging C code. Operates like Basic. 100 common functions built in.

Halo \$392

IBM PC Colour Graphics routines: a complete library of graphics primitives for Fortran, Pascal, Lattice C, Basic Compiler, Basic Interpreter, or Assembler. Halo supports the IBM PC Graphics card, the Hercules Card, some other graphics cards, mice and printers. (Price quoted covers one language/card combination.)

Panel \$641

A powerful and flexible tool for designing and editing data-entry screens and keyboards. It generates program code in your favourite language for each screen.

PLink-86 \$716

A two-pass linkage editor allowing overlays in C, FORTRAN, PL/1, PASCAL, COBOL and Assembler. Define overlays at link time. PLink is available for CP/M-80, CP/M-86 and MS-DOS.

The Greenleaf C

Functions \$351

This library of functions has its main strength in DOS, string, RS232, color text, and printer functions for the IBM PC. Learn the complexities of C from the examples and source code supplied.

ES/P \$467

The Entry System for Programs is the new, third generation program editor that enables programmers to write 50% faster and 100% better. Includes on-line syntax checking, formatting, structure manipulation, and more. Available now for Lattice C.

ASCOM \$384

Asynchronous Communications Control Program available configured for over 80 different 8 and 16 bit micros.

Available exclusively in Australia from:

FAGAN
MICROPROCESSOR SYSTEMS
95 Canterbury Road, Middle Park, 3206
Tel: (03) 699 9899 Telex: AA31604

TULPI MODEM

got carrier from the remote end or not. As the name suggests, this mode is intended for dedicated lines rather than the normal switched telephone network. Once put into the private line mode the Tulpi will only recognise one command, so private line mode won't allow originate/answer mode changing when on-line.

Most other smart modems I've seen allow the disconnect time parameter to be programmed. The Hayes command set allows programming this parameter up to 25.5 seconds, while the default on Hayes command set modems is normally 700 milliseconds.

On-Line

Apart from the problems previously mentioned, the Tulpi performed well when it was on-line and I used it extensively for V.21 300 bps operation to a large number of timeshare and PC remote systems.

The amount of destinations for V.23 1200/75 operation was limited to Austpac, MIDAS, Viatel and some casual file transfers with other V.23 modem users. I had no problems accessing MIDAS, Austpac and Viatel with V.23. When transferring files to other V.23 'outstation' modems it often took several tries to get a telephone line which would successfully support a file transfer, but this is typical of all the V.23 modems I've tested, and the Tulpi certainly performed creditably at V.23 standard. A brief test was made locally using Bell 103 standard and no problems were encountered, and no attempt was made to use the Bell 202 mode.

Documentation

The Tulpi documentation is a neat 15-page, loose-leaf manual with no page numbers or index. It covers the Tulpi command set in detail but is very light on any physical details of the modem. I'd rate the documentation as merely adequate.

The Command Set Again

The Tulpi got its commercial start in life with a commitment from ICL to buy a quantity of the modems from the initial product runs, so certain aspects of the modem were tailored to meet ICL's needs (a feature most strongly reflected in the command set).

I've been using modems which use the Hayes command set for quite some time now and have found the Hayes commands give the user a convenient and largely unobtrusive way of controlling a modem. Certainly I have no complaints about anything

I can't do with a smart modem using the Hayes commands. On the other hand, I found the Tulpi command set cumbersome to use and it often got in the way of my communications activities — but perhaps this is because I'm already used to the Hayes commands.

Some User Comments

I solicited about a dozen comments from Tulpi users about their experiences with the modem through the Software Tools RCPM. Most of the responses were from business users, and boiled down to the same thing: "The Tulpi is a fine modem but some of its features are hard to live with."

The Bottom Line

The hardware engineering on the Tulpi is excellent, but its controlling software leaves a lot to be desired. Fortunately, software problems are much easier to overcome than those attributable to hardware.

Telecorp has already announced some additional features for the Tulpi, including a non-volatile RAM to store the operational parameters so the Tulpi will remember and wake up to its set parameters after being switched off. Others such as the 'answer page' are also in the pipeline, but further comment will have to wait for another time.

Most significantly, Telecorp has announced support for the Hayes command set. It should be available by the time you read this. The move, combined with other changes and new documentation, could well remove any complaints I have about the Tulpi. The final verdict, of course, will have to wait until we've seen one.

If you need a modem for auto-answer operation or have problems with usually reliable but occasionally questionable telephone lines I couldn't recommend the Tulpi modem in the form tested. The command set is usable but cumbersome and doesn't allow sufficient control of all desirable modem parameters.

The Tulpi will serve well in an environment where line reliability is good and your communications software is easily adaptable to the Tulpi command set.

It comes at a premium price with a recommended retail of \$989, although an 'Econo Tulpi' with all the current features but limited future upgradability is due to be released at less than \$700. I'll reserve judgement on whether it represents value for money until I've seen the latest upgrades. □

The Breeze Retail Point of Sale Software...

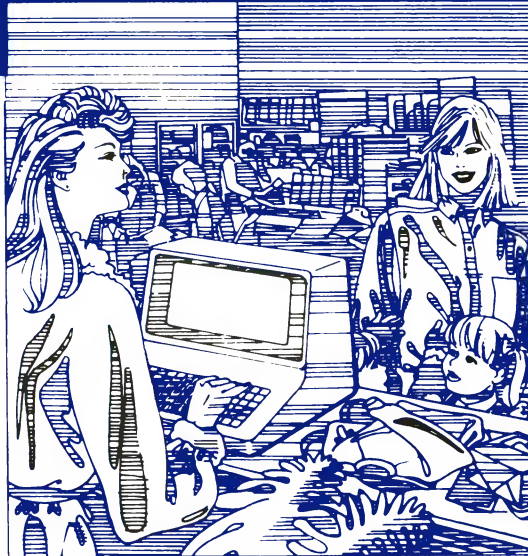
The 'Breeze' sophisticated micro-computer replaces the humble cash register, right at the Point Of Sale — and not only handles normal cash register functions faster and more efficiently, but also operates C.O.D.'s, Laybys, Account Sales and Payments, at the touch of a button.

The 'Breeze' is a breath of fresh air through your entire Point Of Sale operations — from the Point Of Sale flows the complete management functions of any business, including Stock Control, Sales Analysis, Accounts, Invoices, Statements, Sales Tax, Debtors Aged Balances, Sales Representative Commissions, even Banking Slips.

Your most junior cashier will find it a breeze to use, with the Credit Card and Bar Code Reader — because Breeze is specifically designed for fast customer service and accurate collection of data.

The 'Breeze' Software is available on the IBM PC & XT, IBM compatibles, Sirius, Apricot, Ericsson, Wang, Olivetti, Sanyo, Nec, Logitech, Texas Instruments computers.

The 'Breeze' Retail Software System places all this vital information right at your very fingertips.



**improves your profitability
as well as your
lifestyle**

The 'Breeze' features:

- ☐ Cash, C.O.D., Layby and Account Sales
- ☐ Instant update of debtors accounts, inventory records, sales statistics, and sales tax as the sale is entered
- ☐ Full perpetual stock recording and reporting including stock reorder, stock status, and stock taking report
- ☐ Product sales analysis reports including margins
- ☐ Price lists
- ☐ Debtors aged trial balance
- ☐ Debtors statements
- ☐ C.O.D. deliveries listing
- ☐ Layby customer aged trial balance
- ☐ Overdue charges report
- ☐ Bank deposit report
- ☐ Magnetic credit card option
- ☐ Bar code reader option
- ☐ Inter computer communication option

The Breeze Benefits Summary:

- ☐ Easy installation
- ☐ Fast efficient operation
- ☐ 'User friendly' and easy to use
- ☐ Provides flexible and comprehensive management reporting
- ☐ Designed for future growth from diskettes to hard disk
- ☐ State of the art programming provides 'user selectable' systems options
- ☐ Thoroughly tested Software
- ☐ Comprehensive communication options
- ☐ Additional options — including bar code and magnetic stripe card readers
- ☐ Specifically designed for the Retail Point Of Sale environment.

The Breeze — a breath of fresh air for your business and your lifestyle.



Breeze Software (Aust.) Pty. Ltd.
P.O. Box 1220, Geelong 3220.
Telephone (052) 21 6144

BIG CHOICE ART UNION

No. 132



**IN THIS INSTANCE THERE IS NO CHOICE.
YOU WIN THE BEST THERE IS,
AN IBM PERSONAL COMPUTER AT**

MODEL 99 with 512K characters of user memory, the 1.2 million characters diskette drive, a new 20 million — character fixed disk drive and a connection adapter that can be parallel or serial or both plus a ROLLS ROYCE Silver Spirit plus a diamond pendant.

To summarize the winning ticket holder receives an IBM Personal Computer AT with software (value \$15,000) plus a ROLLS ROYCE Silver Spirit (value \$161,000) and a diamond pendant (value \$4,000).

TOTAL VALUE \$180,000

BIG CHOICE ART UNION NO. 132 DRAWN 8TH NOVEMBER, 1985.

Choose this as your \$180,000 first prize or select from these alternatives:

A Silver Spirit Rolls Royce (\$161,000) **plus** a \$19,000 diamond pendant **OR** A Mack Ultraliner (Model MHR 613R) **or** a Mack Superliner (Model 721RS) both with extras **OR**

A Cuddles "35", **plus** a Cuddles "30" Cruiser with luxurious extras **OR**

A GTS 308 Quattrovalvole Ferrari (\$80,300) **plus** a Haines Hunter 850 FBC Cruiser with dual Volvo 6 cyl. turbo motors (\$89,700) **plus** a \$10,000 diamond pendant **OR**

A John Deere 8850 Tractor with a John Deere 1610 Chisel Plough or Cultivator (\$177,000) **plus** a Honda 4 wheel TRX250 (\$3,000) **OR**

A fully furnished 4 bedroom Gold Coast home at 162 Burleigh St, Burleigh Waters (\$175,000) **plus** a diamond pendant (\$5,000) **OR**

A "Round Australia" package including a Range Rover, Viscount caravan, 2 trail bikes, camera equipment, \$10,000 of Flag Inns accommodation and services, a Ford Fairlane, camping equipment, diamond pendant, and a Haines Hunter Cabin Cruiser.

**Each of these
prizes valued at
\$180,000**

**Tickets in the
Art Union are
just \$5.00 each.**

BOOK BUYERS PRIZES

\$10 Book

Choose from: A Ford Spectron XLT **OR** a BMW K100 motorcycle with extras **OR** a Mitsubishi L300 4WD Wagon **OR** Ford Falcon GL Sedan **OR** a diamond pendant

Each valued at \$15,000

\$20 Book

Choose from: A Nissan Patrol 4WD Wagon **OR** a Haines Hunter 19' 4" Cabin Cruiser with 140 h.p. Johnson outboard with Roll-Ezy trailer **OR** a Ford Fairmont 4.1 EFI T-Bar Auto. Sedan (with extras) **OR** a diamond pendant

Each valued at \$20,000

\$40 Book

Choose from: A Ford Fairlane plus a \$2,000 diamond pendant **OR** a 19' 6" Haines Hunter Cabin Cruiser with a 185 h.p. Johnson outboard with Roll-Ezy trailer and extras **OR** a 12.2 metre Haulmark tri-axle semi-trailer complete with gate sides, with cap tarp and side curtains and 6-15RX22.5 wide profile tyres

Each valued at \$26,000

\$50 Book

A Citroen CX25 GTI 2500 plus a \$3,000 diamond pendant **OR** the new magnificent Renault 25 automatic saloon **PLUS** a \$4,000 diamond pendant **OR** a 4 door Range Rover (with extras) **OR** an LTD Luxury Saloon (with extras) **OR** a 21' Haines Hunter Cabin Cruiser with 260 h.p. Merc Cruiser stern drive with extras on a Roll-Ezy trailer

Each valued at \$40,000

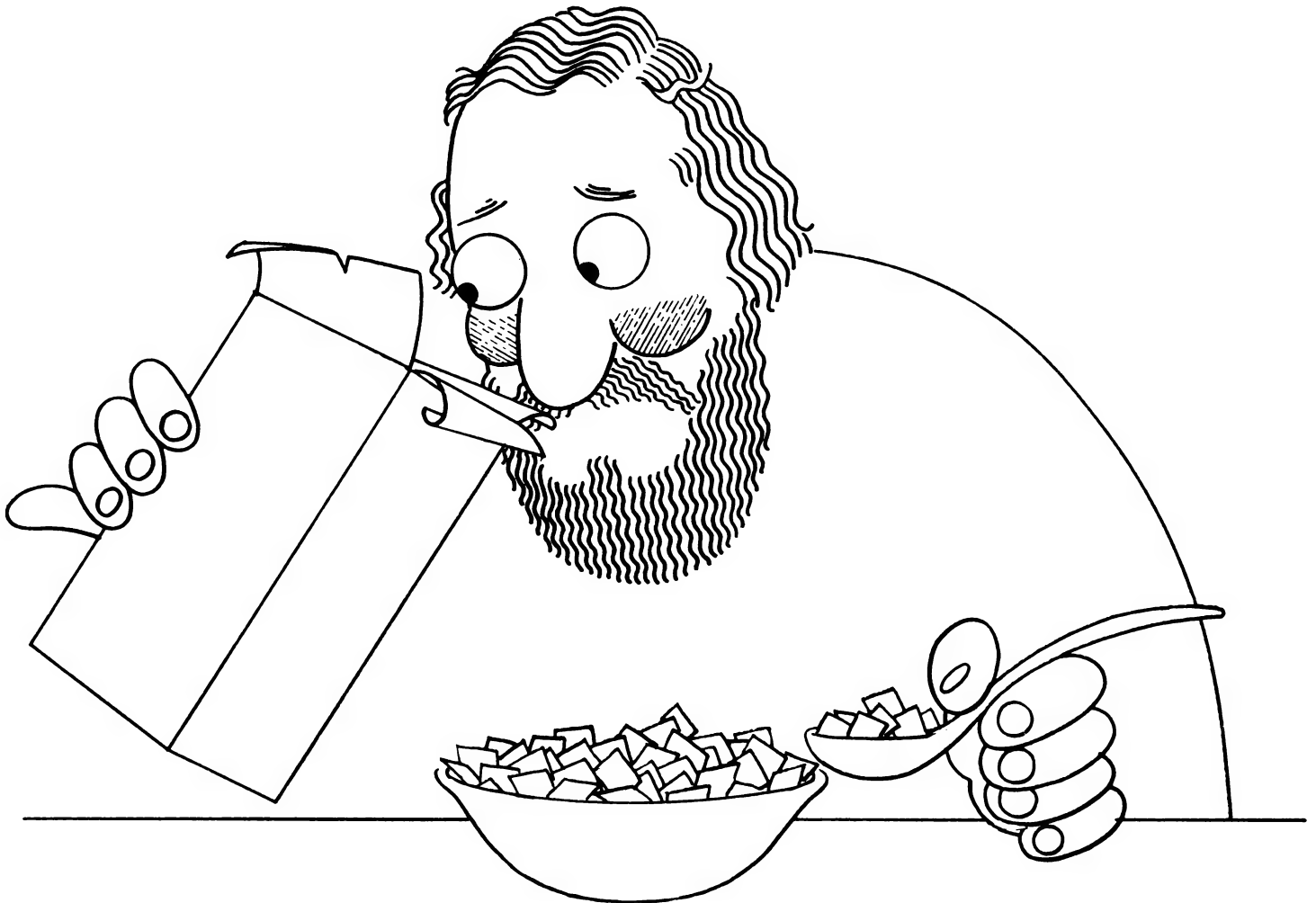
**IN AID OF MARIST BROTHERS SCHOOLS AND
PROJECTS AND SPORTING WHEELIES DISABLED
SPORTS ASSOCIATION OF QUEENSLAND**

For further information regarding prizes, or if the ticket order form has been detached, contact The Big Choice Art Union, 82 Moola Road, Ashgrove, QLD 4060. Phone (07) 38 4134

Permit No. A7390

A.C.T. Permit No. 85/287

WHAT'S IN THE PACKET?



Some time ago we asked Bill Bolton to review various ranges of new modems appearing on the market (the Great Modem Search?). In order to review a modem, you have to use it to communicate with something, so lately Bill has been doing a good deal of communicating. Along the way he's discovered a few things about the kind of data communications networks becoming available to Australians — so here's both the good news and bad news about sending binary data over digital packet switching networks.

COMMUNICATIONS via data packet switching networks is becoming a fact of life for many Australian PC users. The OTC data packet switching network, MIDAS, has been with us for several years now, and more recently Telecom has got into the act with Austpac. Many MIDAS users now access it via Austpac.

The other growing area for data packet switching is digital packet radio; a growing band of enthusiasts combines the hobbies of ham radio and computers. Using techniques originally pioneered in Canada, several local digital packet radio networks are active in Australia. As I write this, the networks are geographically isolated, but moves are afoot to establish an amateur 'data highway' packet radio link between Sydney, Melbourne and perhaps Brisbane.

Now digital packet switching systems are supposed to be as transparent as possible in data terms, which means they shouldn't interfere with any data passed across the network. Transparency is a relative thing, though, and when someone says a digital packet network is 'transparent' to data they usually mean it's transparent to the *content* of the data, rather than to the *timing* of the data.

Why are we Waiting?

This means your data should arrive at the other end without corruption, but there isn't necessarily a guarantee as to exactly when it will arrive. There can be considerable delays between transmission from a computer sending data into a packet switching network and the reception of that data by another computer. The delays may range from fractions of a second (fairly common) to several minutes (fairly uncommon). Those of you who read the Australian computer industry weekly newspapers will be aware of the continuing discussion, claims and counter-claims about the degree of network time delays being experienced by Austpac users, for example.

If the network is using a satellite somewhere in the path the data is following, there is the additional real delay involved in sending the data up to the satellite and back down to earth. This certainly affects MIDAS at the moment, and with AUSSAT almost upon us will probably affect Austpac in the future too.

If you're simply transferring data without any error checking — that is, retrieving textual data from a database — the delays aren't a problem and may often go un-

At present networks are geographically isolated, but moves are afoot to establish an amateur 'data highway' packet radio link between Sydney, Melbourne and perhaps Brisbane.

noticed by human operators. The problem arises when it's time to get down to the serious business of binary data transfer.

The Packet and the PC

Particularly now Telecom's Austpac network is maturing, host computer systems designed for communications with personal computers are starting to be accessible from it — for example, the Mi-Computer Club is seriously working on getting the MiCC bulletin board system onto Austpac with a multi-user capability (don't hound the editorial offices about it just yet, we'll keep you informed of developments).

Several host computer systems in the US which are accessible via Austpac and MIDAS offer various communications protocols suitable for use with PCs for transferring data. The most common of these is the well-known Christensen or Modem protocol, which I've previously described in detail.

The Christensen protocol wasn't designed for communicating over a data packet switching network; the major problem is the delays between the two ends of the network. This means two computers attempting to communicate may not be able to respond quickly to each others' data transfers.

There is an extension to the Christensen protocol called the CRC option. In the original Christensen protocol, the checksum of each block is only one byte long and is a simple modulo 256 sum. This works well in practice for most cases, though it can occasionally allow errors to go undetected in a supposedly error-free protocol.

The CRC option works as follows:

Instead of the receiving program sending <NAK> at the very beginning of a data exchange, it sends the letter 'C'. If the

sending program can use the CRC option, it treats this just like a <NAK>, except that it computes a two-byte CCITT CRC-16 check value and adds it to the end of all blocks instead of the one-byte checksum. If the sender cannot use the CRC option, the 'C' character has no meaning and is ignored. The receiving program should try about three 'C's before deciding the sender will not handle CRC check values. The receiving program transmits a <NAK> to start a checksum Christensen file transfer.

Christensen Protocol Origins

The Christensen protocol was originally devised by Ward Christensen as a protocol for communications between personal computers.

The user of one PC runs a communications program called Modem (or YAM, Mite, Crosstalk or whatever) and dials up another personal computer system, usually an RCPM or similar system. The PC user then tells the RCPM to run a remote communications program called XModem or XYAM. The two communications programs then use the Christensen protocol to transfer files between the two computers.

When Ward Christensen designed his protocol he made several assumptions implicit to its design:

- File lengths can be made exact multiples of 128 bytes for transmission purposes. The smallest CP/M sector is 128 bytes, so 128 bytes was the size of the smallest possible data block on a CP/M disk.
- Data format is eight bits, no parity, one stop bit.
- Both computers are single-user personal computers.
- Both computers are talking to each other over a communications link which introduces no appreciable transmission delays, such as a domestic phone line.

Christensen Protocol Overview

It's been quite a while since the last article describing the Christensen protocol appeared, so let's have a quick look at what happens.

The Christensen protocol is, in practical terms, a half-duplex protocol; information only travels in one direction at once. The protocol works like this:

1. When the receiving program is ready to start receiving data, it transmits a <NAK> (negative acknowledgment) every 10 seconds or so.
2. The sending program waits for a

<NAK> or <ACK> from the receiving program to tell it to start sending. If it hasn't received a <NAK> after a certain time it sends a block anyway to see if that will 'wake up' the receiver. Each block has a block number (modulo 256), 128 bytes of data, and a checksum. Once the block is sent, the sender waits.

3. The receiving program verifies it received the block without errors by comparing the checksum sent with the block to a locally computed checksum for the block. If the received checksum matches, the receiving program sends an <ACK> character, and the sender transmits the next 128 bytes of the file (step 2). If the received checksum doesn't match, or if about 10 seconds expires before a complete block is received, the receiving program sends a <NAK> character to the sender.

4. If the sender receives an <ACK> it sends the next block of data; however, if it receives a <NAK> it re-transmits the last block.

5. Steps 2, 3 and 4 will repeat until the end of the file is found by the sender. Once this happens an <EOT> character is transmitted instead of a block of data.

6. When the receiving program gets an <EOT> it sends an <ACK> to the sender. The file transmission process is complete.

Christensen Protocol Timing

Since the Christensen protocol was originally devised for PC-to-PC communications, it has some problems fitting into an environment where the two computers are connected by a data packet switching network rather than a simple phone line. A packet network can often introduce long delays in what should be continuous communications.

When these delays arise, the PCs using Christensen protocol communications programs may find those programs mistake the delays for a breakdown in communications. If a long delay occurs in the middle of a data packet, which may be in the middle of a Christensen data block transmission, many Christensen protocol implementations interpret that as meaning there has been data lost. These delays result in the following symptoms:

- The receiver cannot successfully receive even the first block of data.
- The receiving program retries a large number of blocks (or <NAKs> a majority of blocks), although it eventually receives the file.
- The receiving program suddenly aborts in the middle of a seemingly successful

The Christensen protocol wasn't designed for communicating over a data packet switching network; the major problem is the delays between the two ends of the network.

file transfer.

- The receiving program has great difficulty in receiving the file, and gives up anywhere from five to 20 blocks into the transfer.
- The file transfer proceeds very smoothly with several successfully transferred blocks, when suddenly every block transmitted is rejected (<NAK>ed) by the receiving program.

Just to make life difficult, all these problems are indistinguishable from other communications problems (such as noisy phone lines, bad parity settings).

A key question for people having problems with Christensen protocol transfers over data packet networks is: "Have you ever successfully done a Christensen protocol transfer over the network?"

Delays Within Blocks

Ward Christensen, the developer of the protocol, recommends that a gap of more than one second be treated as a break-

down of communications. On a normal terrestrial telephone line this makes sense, as there is no reason for a transmission to suddenly stop and then resume. On a data packet network, however, a one-second delay is not only possible, but happens frequently.

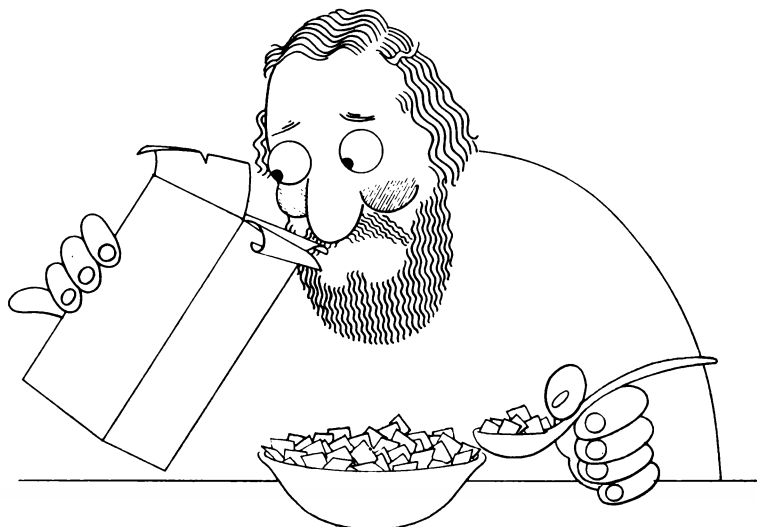
If the receiving program decides this delay is a breakdown of some sort, it will send a <NAK> to the sender, requesting that the block be retransmitted. Unfortunately, the rest of the first block is still 'in the pipe', and when the receiving program gets this block it may do anything from abort the transfer to ignore it.

Let's assume the receiving program handles the rest of the block gracefully. The sender will get the <NAK> sent by the receiving program and retransmit the block. If there's a delay in the middle of that retransmission, the receiving program will <NAK> it too, and so on forever. So when the receiving program is too sensitive to delays in the middle of transmissions, either the receiver gives up very quickly or it <NAK>s every block transmitted.

Delays between Blocks

Fortunately, most implementations of the Christensen protocol aren't that sensitive to delays in the middle of blocks, but other delays can cause problems. When a block is received the PC will immediately <ACK> or <NAK> it and wait for the next block to be sent. Ward Christensen states that if the next block doesn't arrive within 10 seconds, the receiver should send its <ACK> or <NAK> again.

Now, ten seconds isn't a very long time when a data packet network is heavily ►



loaded. The <ACK> or <NAK> will arrive at the sender, the sender will begin transmission of the next block, but the block won't make it to the receiving PC in time. So the receiving program transmits a <NAK>, even though the host has correctly received the first <ACK> or <NAK>.

This means a <NAK> enters the data packet network, even though the sender responded to the first <ACK> or <NAK>. The sender may find itself one block ahead of the receiver, causing the receiving program to quit immediately, or the sender may find itself stuck one <ACK> or <NAK> behind the receiving program, which could result in a successful but extremely tedious file transfer. Alternatively the data packet network delays could be bad enough that the receiving program gets through half a dozen or so blocks and gives up.

Flow Control from the Network

When the user is sending data to a data packet switching network PAD (Packet

Since the Christensen protocol was originally devised for PC-to-PC communication, it has some problem fitting into an environment where the two computers are connected by a data packet switching network rather than a simple phone line.

Assembly/Disassembly interface), the PAD will send an XOFF (Control S) character to the micro if the PC is transmitting faster than the PAD can send the data to the destination on the data packet switching network.

The PAD doesn't understand that you may be trying to perform a Christensen protocol data transfer, so it may send you an XOFF while the sending PC is transmitting a Christensen data block (though fortunately this appears not to happen too often in practice). If <XOFF> gets garbled due to line noise, the sending PC may mistake it for a <NAK> and will immediately retransmit the block — which in turn may cause the data packet network PAD to send even more <XOFF>s and the sending PC to see even more <NAK>s.

If the sending PC thinks every block it transmits is being <NAK>ed it aborts the transmission quickly. This problem can strike any time during an transfer via a data packet network, even though things were going well up to that point (such as on the last block of a 2000-block transfer).

What Can You Do About It

If you want to avoid these problems your Christensen protocol implementation should wait 20 seconds before sending a <NAK> on a lost block. It should wait at least 10 seconds during delays in the middle of a block, and it should respond to (or at least ignore) flow control characters from the node during uploading of files.

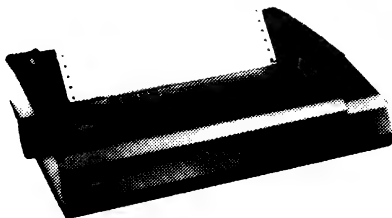
Many programs which have timing problems with data packet networks can be patched to relax their timing parameters. A typical place to look is for calls to a 'timed input' routine (a routine that will only wait so long for a character to arrive). Patching that routine to make it wait perhaps twice as long or patching the code that calls the routine to use a longer time-out value would help.

A Few Other Gotchas

I frequently hear the complaint that few mainframe computers offer communications protocols that are compatible with those readily available on PCs. The basis of this is the thought that a machine as powerful as a mainframe should be able to handle a microcomputer communications protocol without any effort at all, especially as the most common protocol (Christensen) is so simple.

More frequently we are starting to see large mainframe computer systems trying to accommodate communications with those bothersome but prolific PCs. The

SAVE \$\$\$\$\$\$



- Tractor/Friction Feed
 - Graphics
- True Descenders
- Square pin head
- Solid Vertical and horizontal lines
- Near Letter Quality
- 4K Buffer option available at additional cost

Please include \$6.50 for packaging and freight

Prices subject to alteration without notification



73 Eric Street, Goodna Q 4300
P.O. Box 6502, Goodna Q 4300
Telephone: (07) 288 2455
Telex: AA43778 ENECON
New Zealand (4) 726462
Telex NZ30135 AUDITOR



modern PC is built around a technology that treats data in 8-bit chunks — the infamous byte. Not so for mainframe systems, which may treat data in anything from 7-bit chunks upwards.

The internal data format of a mainframe often has no problems in handling text (or 7-bit ASCII data), as that is what it uses to communicate with its operators, but when it comes to handling 8-bit data (such as the 8-bit binary data that makes up a PC-DOS command file) there can be severe storage penalties in a mainframe environment. For example, if the mainframe was set up to handle data in 7-bit chunks, to store a piece of 8-bit data would tie up 14 bits of storage. To overcome this, those mainframe computer systems that allow the handling of 8-bit binary data usually try to make the storage usage more efficient in some way — perhaps by storing 7 bytes of 8-bit data in eight words of 7-bit data.

This may mean there is a little extra overhead (time delay) at the mainframe end of a PC-to-mainframe link when transferring binary data between the systems;

The modern PC is built round a technology that treats data in 8-bit chunks — the infamous byte. Not so for mainframe systems, which may treat data in anything from 7-bit chunks upwards.

more often it means complicated or clumsy software on the mainframe as far as the PC user is concerned.

Surely there must be a Solution ...

Well, there is — sort of. The sort of protocol that can overcome most of the prob-

lems with timing on data networks is called a 'sliding window' protocol. IBM's SNA network architecture incorporates sliding window concepts. Discussion of sliding window concepts can wait for another time, but there is a commercial product called Blast that implements this sort of protocol. As a side effect, it is also commercially available for a wide range of computer systems from mainframes to PCs, so it at least partially overcomes the problems of getting a PC-compatible protocol easily onto a mainframe. Unfortunately the last copy of Blast I saw had a very poor user interface, though it appeared to work well, and it's expensive in PC terms.

Sliding window communications protocols on PCs will be the coming thing. Several of the commercial suppliers of PC communications software in the US are trying to agree on a protocol, and they understand that they have to make it public to get it readily accepted. So stay tuned to *Your Computer* for news on developments. □

SAVE ON TOSHIBA T1500

Just compare A.T.S. Prices — all with 640K RAM, monitor, keyboard, system kit and manual set... and including free word processing software...

	ex tax	incl. tax
Dual 360K, monochrome	\$2895	\$3295
10 Meg + 360K monochrome	\$3840	\$4395
20 Meg + 360K monochrome	\$4150	\$4750
Dual 360K, colour	\$3335	\$3795
10 Meg + 360K colour	\$4280	\$4895
20 Meg + 360K colour	\$4590	\$5250
Toshiba T1100 portable	\$2385	\$2695
P1340 letter quality printer	\$ 883	\$ 995
P1351 printer with tractor	\$1920	\$2150

Please add \$50 for country or interstate delivery.

A.T.S. back you up with maintenance which includes the loan of a replacement machine sent anywhere in Australia.

A.T.S. ACCOUNTING & TECHNICAL SERVICES

14 Georgian Ave, Carlingford, NSW, 2118

PHONE: (02) 872-4522

ATS

ATS

PERFECT COMPATIBILITY

PC/XT/AT

and other compatibles

When **V** wanted IBM Compatible Computer Systems and Add Ons, they chose products and parts from around the world.

AND THEN BECAME A STANDARD

Systems

Priced to sell at \$2400 for complete systems. Service provided via VT trained technicians. 3 levels of service available.

Hard Drives

Ultra Reliable 10 & 20 NEC mbyte complete hard drive systems priced at \$1400 and \$1950. Controller cards utilize advanced dual buffer data technology ensuring faster transfer speed. All units are thoroughly tested and formatted before delivery. Full one year warranty.

Add On Cards

To name some of the many we

supply: network, prototyping, 384k multifunction, 384k memory, 512k memory, floppy disk driver, mono/graphics (hercules equivalent). Colour graphics, ieee-488, eprom writer, ad/da and many more.

Monitors

Super High Resolution Direct drive monitors with tilt and swivel stands. High Contrast European Amber phosphor standard. Full 1 year warranty. Priced \$250.

Accessories

Power supplies, keyboards, disk drives, printers, ram chips.

Available in the near future

V-AT Systems plus add-on cards, portables, 20 meg streaming tape systems, ultra high resolution colour monitors.

Warranty

All **V** products are backed via our 6 months parts and labour policy except monitors and hard drive units which are 12 months. Plus our exclusive 24-hour repair policy. (If we can't fix it within 24 hours, we will just replace the defective modular part).

Assembled and tested in Australia by **V** Compare the features yourself: (see table below)

FEATURE	V -PC	IBM-PC	V -XT	IBM-XT
• 8 slot motherboard with 256k ram	YES	NO	YES	YES
• 150 watt power supply	YES	NO	YES	NO
• Mono/graphics card standard w/parallel printer port hercules equivalent	YES	NO	YES	NO
• 384k multifunction card standard	YES	NO	YES	NO
• 2 parallel/serial/calendar/clock/jstick ports standard	YES	NO	YES	NO
• Choice of 2 styles of keyboards	YES	NO	YES	NO
• 6 months warranty standard	YES	NO	YES	NO

Dealer enquiries welcome — discounts for quantity corporate and government users.

Phone: 569-3700

If you would like more information on our products.



**VIDEO
TECHNOLOGY**

COMPUTER & PERIPHERAL PRODUCT ENGINEERS
17-19 Herbert Street, Dulwich Hill, N.S.W. 2203 Australia
Telex: AA71115 ANBETA

Mailing Address:

P.O. Box 181, Petersham, N.S.W. 2049 Australia

Reviews

The Great Database Search: R:Base 4000.....58

Which is the greatest database of them all? Computer journalists all over the country are gazing into their screens, trying to resolve the issue ... unfortunately, some of them have become mesmerised. Shaking Les once a day for the last month seems to have dislodged the poison, and we finally have an appraisal of R:Base.

The Omni-Reader63

More tedious than typing; slower than we'd ever imagined; and not always accurate — it's the Omni-Reader, an optical character recognition machine. That's not to say the Omni-Reader doesn't have its uses, or that it didn't cause a lot of excitement in our office — we're looking forward to a more refined version.

Microsoft BASIC vs MacPascal.....68

Searching for the best way to pull down your menus, control your mice and graphically interact with people? Kay Fielden has a comparative look at two tools which may help you achieve your desires.

Zardax72

This all-Australian product has matured into its second generation. What sort of offspring has Zardax produced? Richard Walding was involved in its infancy, and notes the family resemblances and differences.

Toshiba 1500.....75

In September, Frank Lee fell head-over-heels for Toshiba's portable 1100. Coming up for breath, he found the 1100's older sister lying in wait. Expensive and attractive, with a high compatibility rating, what were Frank's chances of avoiding another entanglement?

Enable.....83

There's more to Enable than word processing: it's spreadable, graphable, good with tables and voluble. It'll also disable your printer if you fob it off with imitations. The inevitable Frank Lee concludes his review.

Assure.....86

Aetna erupts! Insurance agents assured of success as people run for cover! Humble micro saves the day!

Bit Bucket.....92

The bucket's not brimming this month — just enough to whet your whistle: Tandy's doubled its model 100 and produced another take-it-anywhere, itty-bitty micro; and that enormous program, Symphony, has grown even enormouser with the addition of a spelling checker.

Oh Brother!.....94

Computer-illiterate journo's versus portable word processor; we didn't know whether to pity the Brother WP600 or our intrepid pair of Doyle and Murphy more. Neither side came off unscathed in the confrontation, but the Doyle/Murphy commando-style of learning seems to have produced results.

R:BASE 4000

Since the advent of dBase II, relational databases have been all the rage. In a long-awaited instalment of the Great Database Search, Les Bell investigates R:Base, an advanced model.

IN USING a relational database, you view the data it contains as a collection of tables, each accessible through some key field or fields. The classic example is of a customer-orders database, one table of which contains the customer master records (name, address, account number, and so on) and the other the transactions (an entry for each order).

Ideally, as you move through the transactions table, the master records table should also automatically position itself so the full customer details are immediately, automatically available. In fact, it should be possible to view the two tables at the same time, with matching records 'aligned', so to speak.

dBase II actually doesn't do these things, and so, despite what it says on the manual cover, is not a full relational database. On the other hand, it beat the hell out of the other products which were available at the time, for which we are all grateful, and made a lot of things possible for a lot of people that would not otherwise have been possible. And, of course, it allows the programmer to write systems which appear to the user to be relational.

Technically speaking, a dBase II data-

base is not a database at all, it is only one relation.

And so we come to a product which does follow the classical view of what constitutes a relational database, and which uses rather different terminology from dBase to describe it.

R:base 4000 from Microrim is similar, conceptually, to dBase. They both derive from the relational model developed by E. F. Codd at IBM, and the language they use bears a similarity to SQL, IBM's Structured Query Language, which has now been adopted by the United States Department of Defence as a standard.

But there the similarity ends. Unlike dBase II, R:base was designed for the 16-bit machine environment, and therefore pays no heed to the limitations imposed by the eight-bit CP/M environment. See Table 1, Database Specifications, for some examples.

R:base is supplied in an attractive IBM-style cloth-bound slipcase binder. The main user's manual comprises sections on database structure, data input, data inquiry, reports, data modification, relational operators, transportability, and customisation. This manual is augmented by a

tutorial manual and a demonstration diskette which get the user started.

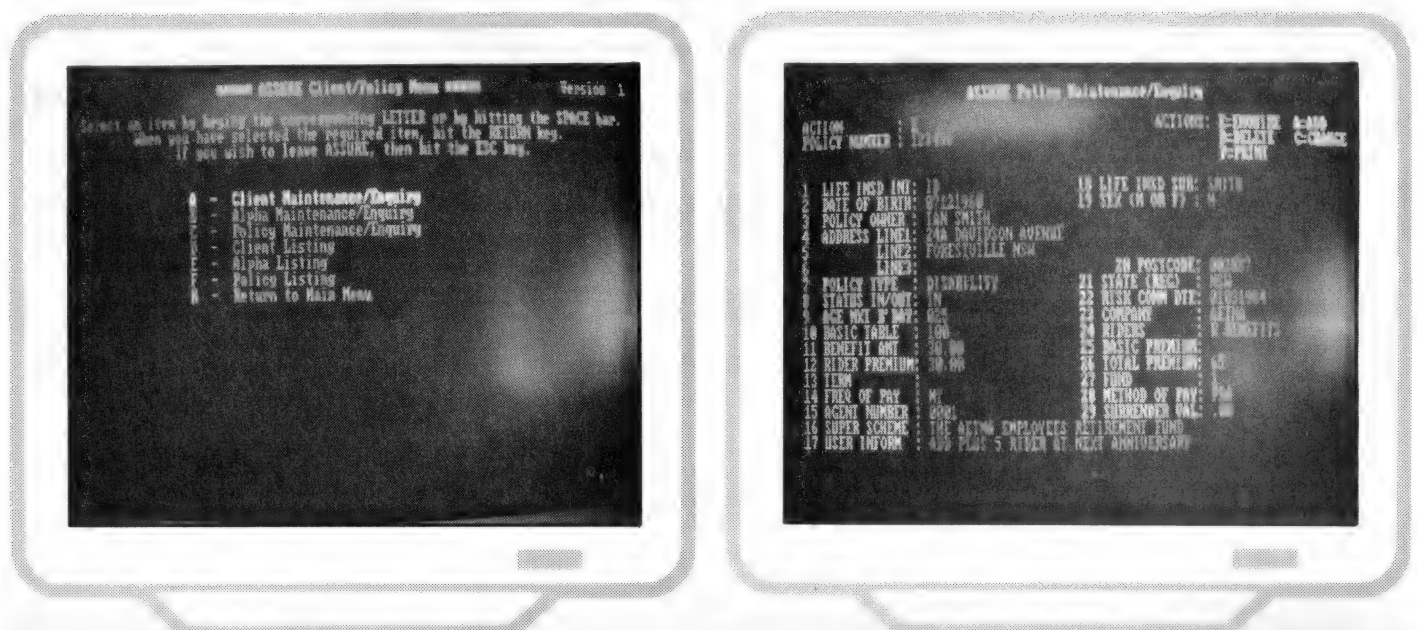
Different Terminology

R:base's terminology is likely to be the first hurdle for those who have previously used dBase II. On the other hand, those who have used 'proper' relational databases are unlikely to have much difficulty, since the terms used are generally the same as those used by Codd in his original work.

To R:base, a database can comprise multiple files, each of which is referred to as a relation. Each relation comprises multiple attributes, which dBase users would call fields, and spreadsheets users can think of as columns. A set of attribute values is a row (to dBasers, a record).

R:base is driven by a data dictionary which defines the database, and which contains considerably more information than a dBase structure. Obviously it contains the attribute definitions (names, types, sizes), but it also holds password information (owner password and relation passwords), and the definitions of the relations which make up the database.

In setting up the data dictionary, the user defines the attributes first, and then



R:BASE

goes on to structure them into relations. An important capability of R-base is provided by the 'Rules' entry during database definition. This allows the database designer to specify validation rules for use during data entry, based either on range or other comparisons, or on validation against another relation. For example, to validate entry of postcodes, it would be easiest to check an entered postcode against a database of postcodes. The designer can specify error messages to be issued from invalid data.

Passwords can be set for both the owner of the database and the users. User passwords can allow read-only access to a relation or can allow a user to modify a relation. In this way, for example, a personnel database could be set up which allows the personnel director overall access to the database, his or her assistant access to read and update only those relations which detail positions held and review details, and which allows someone from accounts, probably the paymaster, to read, but not write, payroll data.

The database can be modified to add attributes and relations, rename attributes and relations and delete relations. Other commands allow backup of the complete database (remember it comprises multiple files), as well as reloading. And, of course, files can be indexed on some key value, to provide faster access. Indexing uses a rather different technique from dBase, apparently maintaining the keys in the main database, and requires only 12 bytes' overhead for each row indexed, plus some 30 per cent overhead.

Entering Data

Presumably, after creating a database, you

Maximum Relations (Files) Per Database:	40
Maximum Attributes (Fields) Per Database:	400
Maximum Row (Record) Size:	1530 characters
Maximum Rows Per Relation (Records Per File):	2.5 billion
Maximum Rows (Records) Per Database:	100 billion

Data Types:

Date	— Represented as MM/DD/YY or in any order you specify.
Time	— HH:MM:SS, representing hours, minutes and seconds.
Dollar	— Range of +, - \$99,999,999,999,999.99
Integer	— Range of +, - 999,999,999
Real	— Range of 0 to +, - 10 to the power 38 with 6-7 digit accuracy in scientific or decimal point notation.
Text	— 1 to 1530 characters
Command Line Input:	1600 characters maximum.

Table 1. Database specifications

will next want to enter some data. This can be done in three basic ways: straight data entry, entry through screen forms, or if you are converting an existing system to R-base, by reading a data file.

The LOAD command allows data to be entered into a relation by typing it across the screen as though it were a BASIC data file without the comma delimiters. Not an appealing option. Alternatively, one attribute can be entered right through a file, then the next attribute, and so on, which is slightly better. Otherwise, LOAD WITH PROMPTS can be used, which prompts with the attribute name and type, simplifying the process considerably.

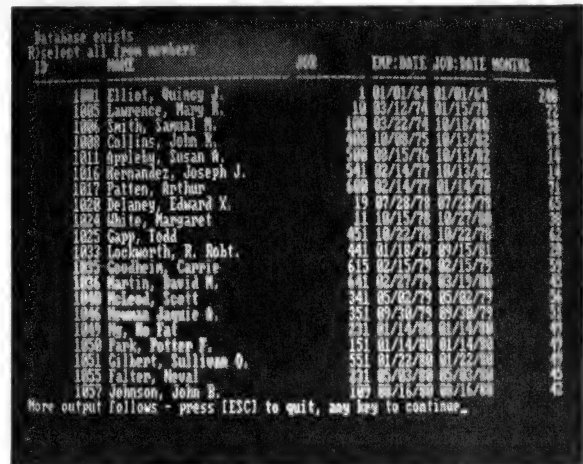
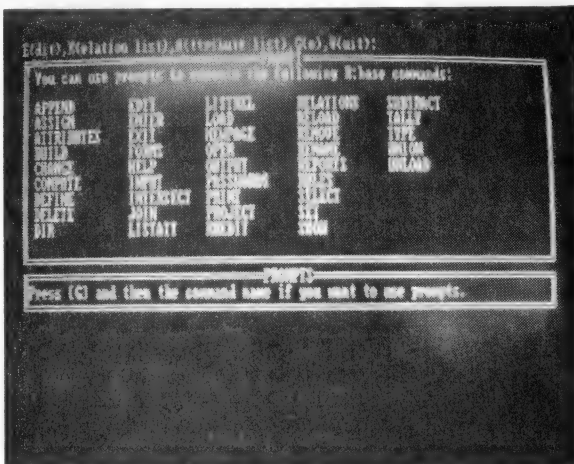
After working this way for a while, you will probably decide to design a screen form for data entry. This is done using R-base's Forms Editor module, which allows you to 'paint' the form on the

screen, specifying the prompt text and entry locations for attributes. Once this has been done, the ENTER <formname> command will allow more sophisticated data entry.

The forms entry mode is basically similar to that supported by dBase II 2.4, with full screen cursor movement and editing. However, it also allows validation during data entry, with the ability to display error messages at the top of the screen. The forms are simpler to use, if less versatile, than dBase's @ ... SAY ... GET format files.

The LOAD command comes into its own when used to load data from a data file, rather than from the keyboard. It basically works with comma-delimited (BASIC) data files. In addition, an audit trail is simple to construct using the R-base ECHO.

Editing can be performed in a similar way, using the Change and Assign com-



mands, or you can use interactive editing with forms.

Inquiries

Inquiries on the database are phrased in an SQL-like syntax:

```
SELECT ALL FROM CUSTOMERS
WHERE BALANCE GT CLIMIT SORTED BY
BALANCE
```

The SELECT verb is the basic command to list the contents of a relation, while WHERE allows the use of conditions to restrict the result, and SORT allows sorting of the selected rows on up to 10 attributes. SELECT prints the attribute names at the top of its listing and may also take optional arguments to specify totalling of fields and restricted field widths.

With all these various options, the SELECT command works out to be nearly as powerful as the dBase REPORT command; the only thing it lacks is subtotalling. The TALLY command calculates the distribution of an attribute; in other words, it reports how often a particular attribute value occurs throughout the relation. COMPUTE allows calculation of the minimum, maximum, average, sum and count of an attribute, or all of the above.

For more sophisticated reporting, R:base does have a report writer which will allow headers, footers, and more complicated page layout than the SELECT command. Within a report, you can create up to 10 intermediate variables, which can be

With all its various options, the SELECT command works out to be nearly as powerful as the dBase REPORT command; the only thing it lacks is subtotalling.

used to calculate averages, subtotals, or whatever.

Relational Commands

The key to R:base's power lies in its relational commands: INTERSECT, UNION, SUBTRACT, PROJECT, JOIN and APPEND. These operate on entire relations at a time.

INTERSECT outputs a new relation which contains those records which appeared in both the input relations, while SUBTRACT outputs those records which do not appear in both relations (opposite of INTERSECT). The UNION command outputs all records from both inputs, with duplicates eliminated. This command is also used to add a new attribute to an existing relation.

PROJECT is like SELECT, but with the output going to a new database, rather than the screen. Like SELECT, it supports

the WHERE conditional argument and the SORTED BY argument.

JOIN is similar to INTERSECT, but with only a partial match required. It combines rows from two relations, based on a matching attribute they share. APPEND does what it would suggest.

Like dBase, R:base is programmable, although its language is not quite as rich, supporting only the IF and WHILE commands for flow control. One major restriction is a prohibition on nesting WHILE commands. However, menu-driven applications can be set up, and there is less need to perform very low-level programming than with dBase.

The construction of complex command lines and unprompted procedures such as database definition can often stymie the first-time user. R:base gets around that nicely with two extensions: Help and Prompt modes. The Help system provides assistance with R:base keywords and procedures. More powerful is the Prompt mode, which prompts the user for input as it constructs command lines.

All in all, R:base emerges as a rather more powerful database manager than dBase II. It is closer to being a true relational database, although it still falls short, but its input validation facilities and richer set of relational commands make it more powerful for applications of moderate complexity. We also liked the password facilities and prompt mode as particularly

PRODUCT DETAILS

Program: R:base 4000
Made by: Microrim
Useful for: Data storage and handling facilities
Hardware req'd: 256 Kbytes of memory, PC-DOS or MS-DOS (1.1 or higher), CTOS (6.1 or higher), BTOS (6.1 or higher)
Extras included: None
Options: Clout and Report Generator
Price: \$630 for R:base and \$205 for Report Generator
Review copy from: Imagineering, 579 Harris Street, Ultimo 2007; phone (02) 212 1411.

PRODUCT DETAILS

Program: Clout
Made by: Microrim
Useful for: Natural language enquiry of databases
Hardware req'd: 256 Kbytes of memory, R:base-developed databases
Price: \$300
Review copy from: Imagineering, 579 Harris Street, Ultimo 2007; phone (02) 212 1411.

APPEND	OPEN
ASSIGN	OUTPUT
BUILD	PRINT
CHANGE	PROJECT
COMPUTE	PROMPT
DEFINE	RBEDIT
DELETE	REMOVE
DIR	RELOAD
EDIT	RENAME
ENTER	REPORTS
EXIT	SELECT
FILLIN	SET
FORMS	SHOW
HELP	SORTED BY
IF	SUBTRACT
INPUT	TALLY
INTERSECT	TYPE
JOIN	UNION
LISTATT	UNLOAD
LISTREL	USER
LOAD	WHERE
NEWPAGE	WHILE

Table 2. R:base commands

powerful extensions.

R:base's major weaknesses are in report generation and programming, but then, Microrim has two more powerful versions of R:base (5000 and 6000) to handle more complex tasks. There is also an Extended Report Writer available for R:base which should easily correct any deficiencies in the bare product.

CLOUT

A more interesting option for R:base is CLOUT, the Conversational Language Optional Utility. This is a report program which is based on artificial intelligence techniques, and which allows natural-language enquiry of the database.

The system is driven by a dictionary, which starts off with a vocabulary of 300

CLOUT can give an eerie impression that there's someone inside the computer reading what you type, rather than a computer program.

commonly used words, and which the user can extend by adding another 500 more specialised words or phrases. CLOUT responds to command lines built up out of these words.

CLOUT allows considerable latitude in the input. For example, it will identify misspellings, and rather than simply bundying off, will respond by asking the user:

By 'TRINING' did you mean 'TRAINING'? (Y/N)

Similarly, punctuation is optional; the system will request clarification if it must resolve ambiguities. If the request contains a word which has not previously been defined, CLOUT will ask a series of questions to arrive at a definition, then proceed.

In the tutorial section of the manual, a personnel database is used as an example. Sample requests vary from the simple:

Show me a list of employees and when they were hired.
through:

Which employees worked on which projects?
which displays only the attributes specified, to the multi-stage:

Who worked on telemetry and what was their security? What were their last year's sales?

In this case, CLOUT knows the user is referring to the previous question through the presence of the word 'their'.

Other words available include 'rank' and 'sort' for sorting, 'group by' and 'broken down by' to allow headers or subtotalling, 'except', 'between', 'how many' and others.

While enquiries are typed in as text, most other communication with CLOUT is through a menu structure that allows the user to add new words, delete them and generally maintain the dictionary. A new dictionary is set up for each database with which CLOUT is used.

After some work in setting up the dictionary for a database, CLOUT can give an eerie impression that there's someone inside the computer reading what you type, rather than a computer program. Of course, occasionally it will fall over on quite trivial requests, but after extending the dictionary, all will be well with that and related enquiries.

CLOUT is a very interesting product. It's probably true to say that anyone who can set up an R:base database and design input validation, screens and reports would not need CLOUT. However, less sophisticated users would benefit from it. I'd be interested to see CLOUT used, for example, in a department store to list gift ideas for shoppers. □

ATTRIBUTE	NOECHO
BLANK	OWNER
DOLLAR	PAGESIZE
DUPLICATE	PASSWORD
ECHO	PRINTER
END	REAL
FORM	RELATION
FORMING	RULES
FROM	TERMINAL
HEADINGS	TEXT
IN	TIME
INTEGER	TO
KEY	USING
LAYOUT	VARIABLE
LIMIT	WITH

Table 3. R:base keywords

**Australia's
only touring
magazine**

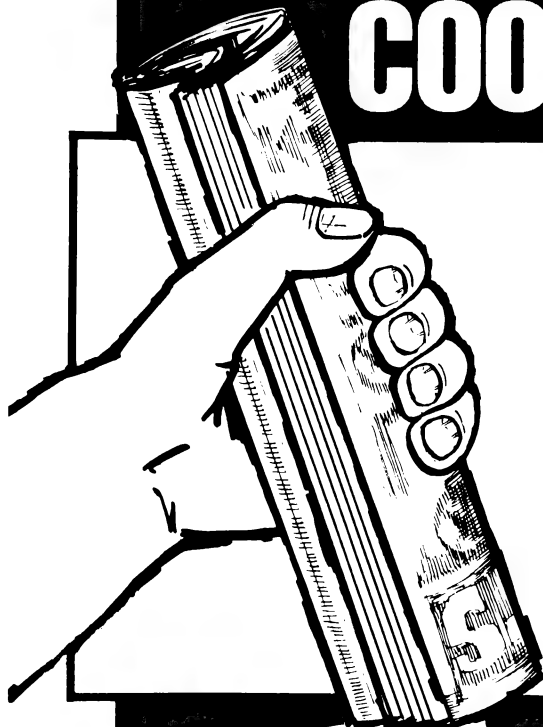
Making Tracks

At Your
Newsagent

You've been waiting for

Circuits

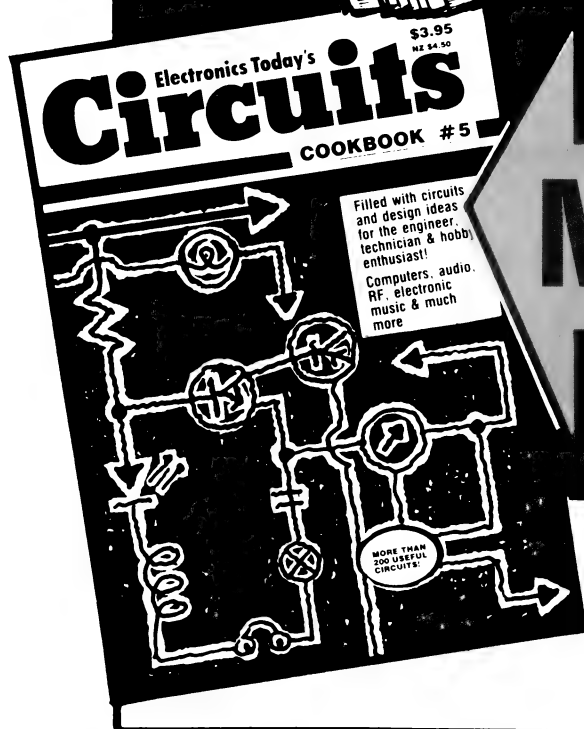
COOKBOOK #5



**200 Circuits & Ideas
for the Engineer
Technician and
Hobby Enthusiast!!!**

**Computers + Audio + RF
Electronic Music and
Much, Much more . . .**

AN ELECTRONICS TODAY PUBLICATION



NOW IT'S HERE !!!

**PICK UP YOUR COPY
FROM YOUR NEWSAGENT**

ALSO AVAILABLE BY MAIL ORDER
\$3.95 plus \$1 postage

FEDERAL MARKETING
P.O. BOX 227 WATERLOO, N.S.W. 2017

OMNI-READER

Optical Character Reader

Have you ever thought how wonderful it would be if your computer could simply read text into itself without its having to be laboriously typed in? Hardware that achieves this — called optical character recognition equipment — has been around in some applications for a while, but till now it's never been available for micros. Frank Lee takes a look at the first chink in the armour — the Omni-Reader — which will at least read some things directly into your trusty machine.

OPTICAL character recognition (OCR) equipment has long been regarded as part of the ethos of 'heavy' computing; large organisations such as universities, banks, credit unions and their ilk make heavy use of OCR devices. These are generally heavy-duty equipment capable of reading a wide range of scripts (or fonts), including good-quality handwritten manuscripts. OCR has typically been an expensive operation, since it relies on extensive research in the area of artificial intelligence, and the hitherto relatively few OCR users have had to carry the cost of funding that research.

Oberon International's Omni-Reader is a first entrant into low-cost OCR technology, aimed at the high-volume micro-computer market. The recommended retail price of \$1920 is about an order of magnitude smaller than other commercial readers. Mind you, those readers go like a bullet, read pages automatically, and can handle a wide range of materials in a variety of print qualities. The Omni-Reader can't quite do all this, but it's a step in the right direction. It has the potential to make many microcomputer users reconsider OCR as a viable proposition. Just think — all those magazine listings of program printouts; wouldn't it be nice to be able to read them directly into your machine?

Well, as a matter of fact, I tried. Alas, it didn't work. The print quality was below par. But despair not — hope is on the

horizon. First, however, a little background.

Testing it in Real Life

My interest in the Omni-Reader was kindled when a friend became involved in a direct mailing exercise. He had contrived to obtain a hard copy listing of his victims' names and addresses, which he intended to have typed up using a database system so that labels could be printed as required. The typing operation was horrendous; there were thousands of names. However, the print quality wasn't too bad. It had been generated on an IBM impact chain printer of unknown vintage, but with a well formed sans-serif typeface using ten characters per inch. The folk at Audio Engineers felt there was a good chance the Omni-Reader might cope with the job.

The Omni-Reader duly arrived in a large, expansively illustrated cardboard box. There emerged a deceptively simple-looking flat-bed page holder with a hinged system holding the sliding read head (see illustration). Being technologically uncouth, I ignored the intimidating documentation, and fitted together everything which could fit into anything. By the time I'd finished, there was a separate power supply hooked between the mains power and the reader, the sliding read head was plugged into the socket at the rear of the paper holder, and my IBM PC-compatible serial port was connected to the reader's

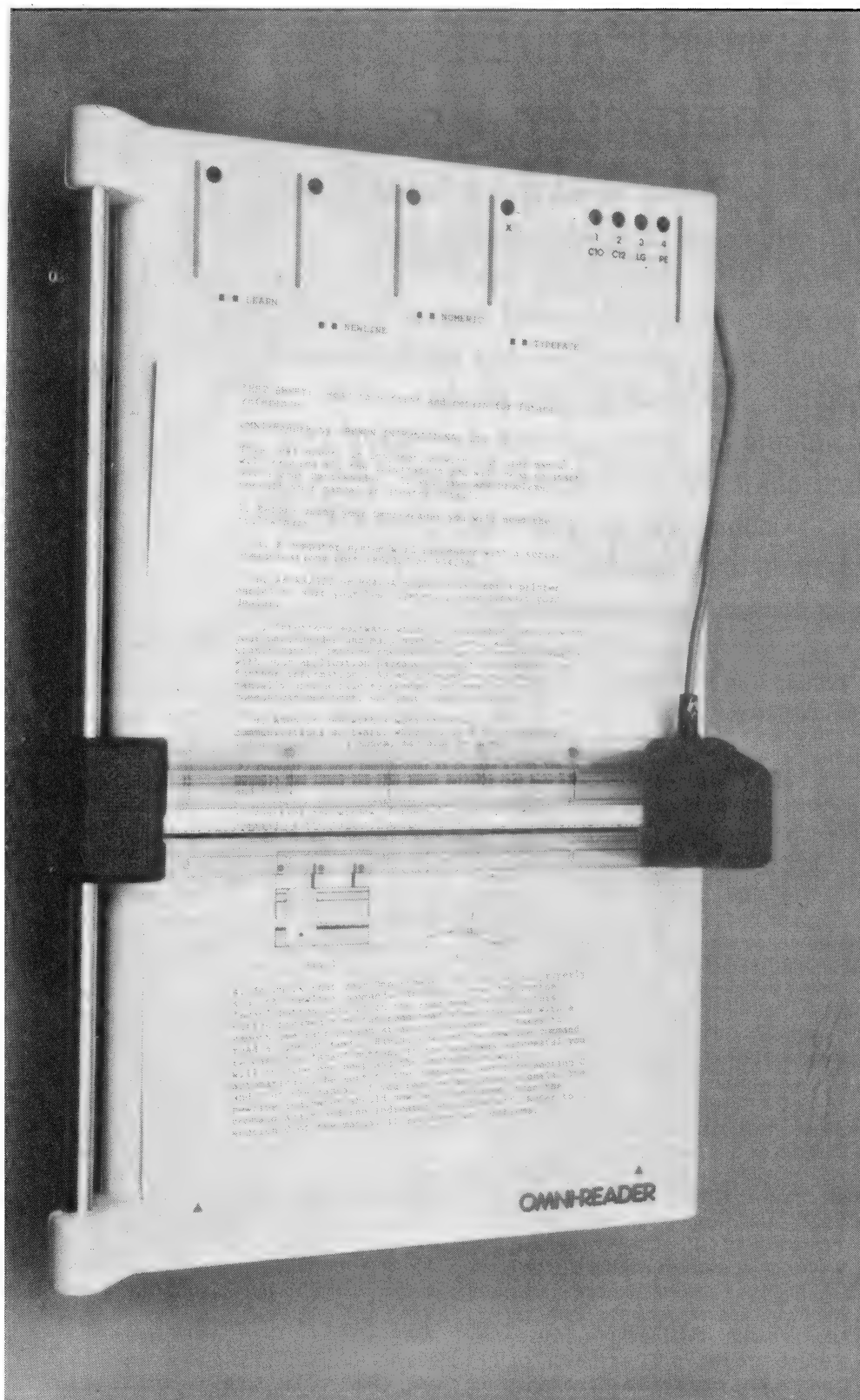
serial port using the cable normally reserved for my modem.

You should understand that my testing scenarios generally call for examination of the documentation only after all else fails. The multiplicity of documentary bits and pieces with the Omni-Reader simply reinforced this view.

Naturally, it didn't work. Let that be a lesson, Frank.

You see, the Omni-Reader is a serial device. As such, one must ensure that the reading software on the host computer matches the communications protocols of the attached equipment. I had hoped it would be possible to read the sample test sheet (already in place on the plotter) using Wordstar, but for that there was no short cut.

I reached for the small manual entitled *Omni-Reader Interface Guide*. Oh woe! All that technical stuff about RS232C protocols, pin definitions and stuff. More about baud rates and parity requirements. Lots on what the Omni-Reader does with control codes (I don't care, man, I just want to read stuff!). Then finally a simple BASIC program to read from the Omni-Reader and display the data on the screen. Before trying that, I discovered the rest of this manual launches into interfacing techniques for the IBM PC, eight-bit systems running CP/M-80, the Apple IIe and IIc, the Mac, the Lisa and the Victor/Sirius. These ►



people have done a thorough job, and technical information is there if you need it.

By now 15 minutes had elapsed since the Box Opening. How much longer would it take to see words appearing as if by magic on the screen?

Not long, as it turned out.

Since I had specified to Audio Engineers that I was testing it with an IBM PC (more specifically my President 16-210 compatible known locally here at Mount Crisis as Ron), they also supplied a disk containing the 'Interface Software for the IBM PC'. The disk was accompanied by two separate documents. I guessed (correctly) that one should read the one entitled *How to Set Up Your Omni-Reader Software on IBM PC, XT, and PC Compatibles* before opening the *Interface Software* manual. Confusion would have reigned supreme if the reverse order were followed. In fact, I can't see why the two authors (clearly unknown to each other) didn't choose to collaborate in the preparation of one straightforward manual.

I struggled through the installation of a new DOS CONFIG.SYS file, and included the driver OMNI.COM on my hard disk. I also copied the RUN-WS.BAT file, which contained the following two commands:

```
omnicon ws.omn
ws
```

The first command invokes a configuration file WS.OMN, which specifies the communications protocols required. I didn't have to do a thing apart from checking the setting of the DIP switches on the rear of the Omni-Reader.

Science and Typstyles

On power-up, the Omni-Reader is set to comprehend a Courier 10 typeface. The rear switches specified 10 characters to the inch (10 pitch), and these conditions matched the sample sheet mentioned above. I ran the RUN-WS batch file, which in turn called up Wordstar. I gave Wordstar a command to begin editing a new file, then slid the read head across a line of text. After a short pause there was a single beep (indicating a satisfactory read), then the line popped up on the screen — just as expected. Isn't science wonderful? At this stage the elapsed time was 35 minutes from Box Opening. Not too bad, I guess.

The Omni-Reader can at present cope with four different fonts, namely Courier 10, Courier 12, Letter Gothic 12 and Prestige Elite 12. These may be read at either 10 or 12 pitch, provided the reader's switch is set accordingly. The default font (on

power-up) is Courier 10, but the others can be selected by scanning a TYPEFACE command.

As a matter of fact, this is a cute feature of the reader. A command is simply a word preceded by two square black blobs. These have been printed on the plotter, and may be scanned as if they were text to be read. The two blobs signal to the internal software that these are commands to be obeyed, rather than text to be transmitted.

The other printed commands are LEARN, NEWLINE and NUMERIC. The LEARN command gave me hope that we could teach the reader how to understand the line printer's font. No such luck, as you'll see later.

The NEWLINE command toggles the flag which tells the reader whether to send a carriage return at the end of each line. The default is no carriage return, so it's normal to scan this command at the start of a session. When active, a red LED glows above the NEWLINE command.

The NUMERIC command speeds up the recognition process when the data is numeric or punctuation.

The LEARN command is undocumented, so I rang the principals in England to find out more. It seems one can download a pattern recognition program from the host computer into an 'extra font' RAM in the reader — *but* the reader isn't sufficiently sophisticated to learn a new font by itself. The training is done on the host computer using software not yet available to users. The company plans to distribute 'extra font' files by the end of the year, but unfortunately, standard line printer output is not on the agenda.

Several other commands have been printed for convenience in the O-R/I User Manual. These include LARGE (for text which is slightly oversized), SMALL (for undersized text), POORCOPY (for poor-quality text), and NORMAL (to return to normal mode). Use of the POORCOPY command roughly doubles the processing time.

It just didn't want to know ...

Alas, even with POORCOPY, the reader wouldn't so much as sniff at the name and address lists. Each time we tried to scan a line, there would be a delay of a few seconds, then a beep-beep signalling its unhappiness with the text. This happened even with good-quality photocopies which increased the contrast. We discovered the Omni-Reader also gets upset if the text is proportionally spaced, or if not printed

***You can download a
pattern recognition
program from the host
computer into an 'extra
font' RAM in the reader
— but the reader isn't
sufficiently sophisticated to
learn a new font by itself.***

with a carbon ribbon.

I also tried it on text printed with the excellent NDK 5025 'near letter-quality' dot matrix printer, and the NEC Pinwriter CP3. It couldn't read them either, although it was almost impossible to tell the difference from real daisywheel output by visual inspection. On the other hand it could easily read any of the standard four fonts printed on my Qume-compatible daisy-wheel printer.

How It Works

The complete system occupies an area of 27 by 41 cm of desk space, and needs to be right alongside your computer. Since I also use a mouse, there was some competition for real estate during the tests. A little juggling of peripherals soon set things shipshape.

The optical read head slides along a clear plastic ruler, which in turn is able to slide up and down the page on the flat bed of the plotter. The material to be scanned is held in position on the bed by two adhesive strips, while the ruler is kept horizontal by an adjustable hinge mechanism linking it to a slide rod on the reader's left side.

The ruler carries an optical clock track which the system uses to gauge both scanning speed and direction, so the reader can handle line scanning in either direction. A three-position toggle switch on the read head lets you signal the start of a line scan, or the cancellation of a misread line.

To read a line, the ruler must be carefully positioned over the line, the switch pressed to signal the start of a scan, then the head slid across the line at about the speed you would visually read the material. If you scan too fast or too slow, there is a visual/audible error indication. In practice, there is a wide tolerance for speed

variations.

After each line is scanned there is a short processing pause followed by a single beep if the read is deemed correct; two beeps are emitted if the reader has had difficulty in reading. In the event of a single beep, the line data is transmitted to Wordstar, exactly as if it had been typed via the keyboard. This trick is performed by the resident driver (OMNI.COM), which is loaded with DOS.

You can accept a misread line simply by reading the next line, and misread characters are replaced by question marks in the text. It's good practice to check the text, even if the all-clear single beep is given, since sometimes it mistakes a 'y' for a 'v' if the descender isn't fully visible through the slot in the ruler. (A longer ruler is available for use with documents which are too wide to fit under the short standard ruler.)

Test Results

I tried the unit on a typical 124-word business letter that had been typed on a good-quality daisywheel printer. It took me 130 seconds to scan the document, giving a total equivalent of 57 words per minute. While this isn't as good as many professional typists, it leaves my rate for dead. Perhaps my speed would improve with practice. On the other hand, there were three errors undetected by the reader, and their correction added significantly to the overall processing time.

For each line scanned, there was a processing pause of about three seconds, making a total of 4.5 seconds to scan and process a typical line of text. Another problem was the tendency of the text material to slip from the adhesive strips, requiring frequent realignment while reading.

For a situation where the required data has been printed with a letter-quality printer, and if the data is not also available in machine readable format, the Omni-Reader should be considered as an alternative to direct typing. However, the machine is not a workhorse. The read head and rule mechanism must be treated with respect, and might not stand up to the rigours of full-time work in an office environment. The Omni-Reader should probably be regarded as a tool for reading the occasional material which would otherwise be a pain in the neck to have retyped.

On the other hand, if Oberon were to come good with a downloadable typeface for the IBM 1403 line printer, then I would certainly reconsider its use for the mailing list job. □

SAVE 33 1/3%

your computer

NOW! is the best time to subscribe!
SAVE 1/3 ON ONE AND TWO YEAR SUBSCRIPTIONS

Subscribe today and ensure that you receive your copy of Australia's leading computer magazine reliably every month. Your Computer is written by people who use computers for people who use computers.



- ★ MORE POCKET PROGRAMS
- ★ MORE INTERESTING FEATURES
- ★ MORE TUTORIALS
- ★ MORE PRODUCT SURVEYS
- ★ MORE BUYERS GUIDES

(offer now valid until 30/11/85.)

**your
computer**

**AIMS TO SHOW YOU HOW TO MAKE
YOUR MICRO WORK — HOW TO GET IT TO DO WHAT YOU WANT
WHEN YOU WANT IT, WHETHER YOU'RE INTERESTED IN GAMES,
UTILITIES OR BUSINESS APPLICATIONS**

To Subscribe, simply

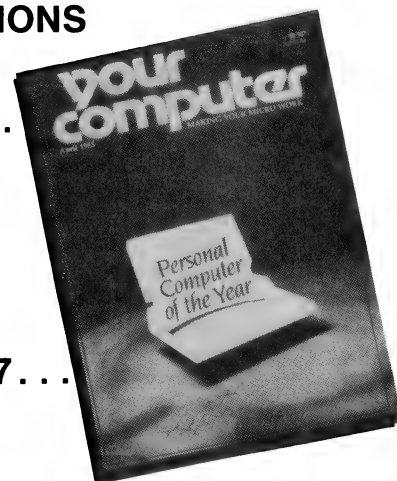
1. Complete the card opposite...
2. Choose one or two years...
3. Mail the card free to us!

Here's how it works...

12 issues = \$23.60 (\$11.80 saved!!)

or better still, guard against price rises until 1987...

2 years = \$47.20 (\$23.60 saved!!)



YOUR COMPUTER

**Whether in business or just playing games...
MAKE YOUR MICRO WORK FOR YOU!**

The Perfect Match



Your hardware and Perfect software Now available for the IBM P.C. and the Apple IIe/IIc

PERFECT WRITER

\$395.

"Pop Up" Command Menus.
Lesson Disks included.
Process larger Text Files
than your computer's memory.
Handle up to 7 documents
simultaneously.
2 Window Display.
Perfect Speller
Perfect Thesaurus

PERFECT FILER

\$325.

Full Mail Merge/Sort
Capacity with Perfect Writer
16 Ready to use Data Base Forms
Unlimited record storage.
"Pop Up" Command Menus.
On system Help Screens.

PERFECT PACK

\$595.

PERFECT CALC

\$325.

"Pop Up" Command Menus.
Have up to 15 different Spread
Sheets in memory at one time.
On System Help Screens.
Share Data with other spread sheets.
Lesson Disc included.
2 Window Display.

PERFECT LINK

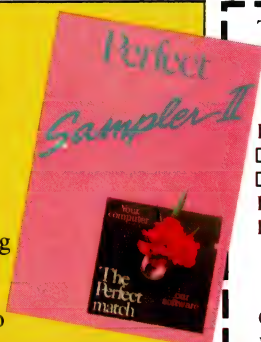
\$189.

X — Modem Protocol.
Standard ASCII Data Encoding
Structure.
"Pop Up" Command Menus.
Wireless Disk File Transfer.

PERFECT LIBRARY \$795.

IBM PCXT supplied by courtesy of IBM and Parity Computer Ltd.

Perfect has a complete
summary of Perfect Writer,
Filer and Calc which comes
in a concise, easy to read
booklet complete with two
disks entitled the Perfect II
Sampler Kit. You can
practice entering data on
your own P.C. before buying
any software. See how easy
Perfect Software is to use
and just how much it can do
for you.



To: **Perfect Information (Australia) Pty. Ltd.**
P.O. Box 946, Crows Nest NSW 2065
Phone (02) 92 6777 or (02) 92 7777

Please send me the following

- ☐ More literature on Perfect software ☐ The name of my nearest Perfect dealer
☐ The Perfect II Sampler Kit \$9.95

I enclose my cheque for \$_____ or please debit my American
Express, Diners Club, Visa, Mastercard or Bankcard.

Card expires _____ Signature _____

Name _____

Address _____

Postcode _____

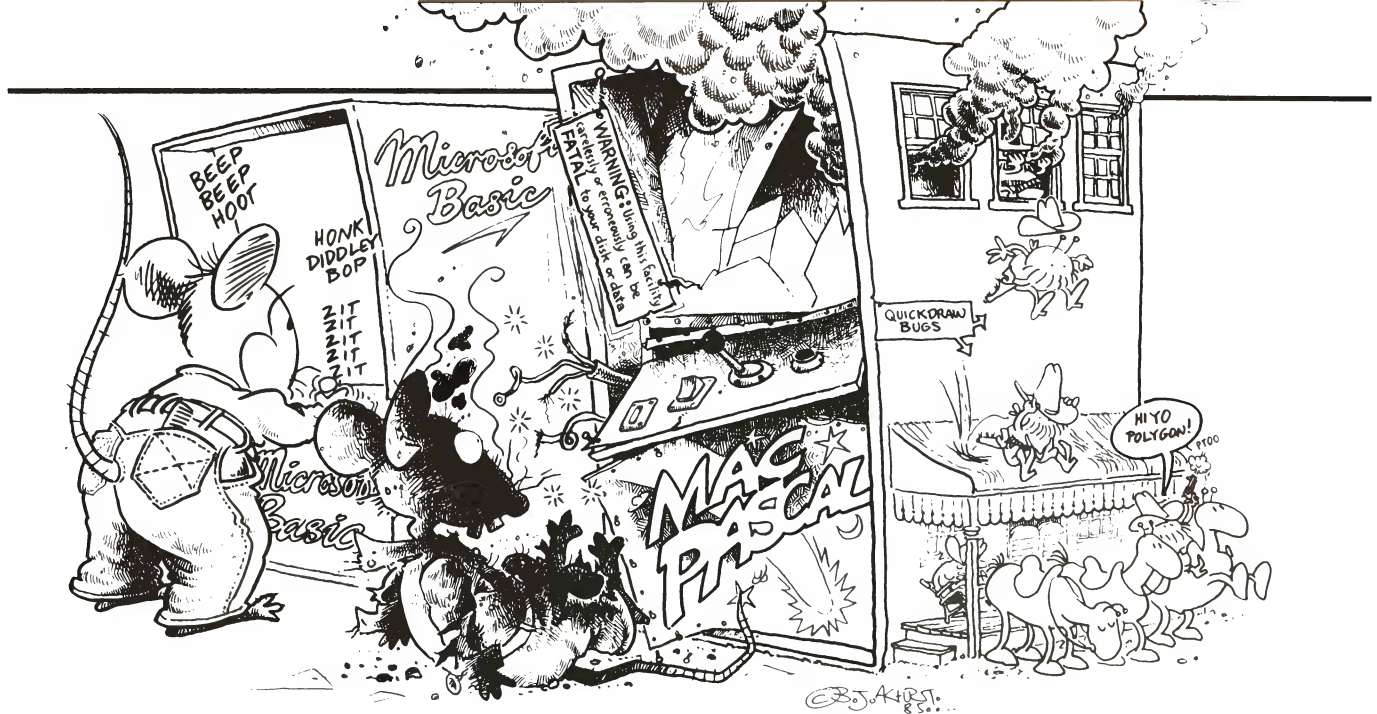
Phone No. _____

Perfect

TM

Apple is a registered trade mark of Apple Computer Inc.

IBM is a registered trade mark of
International Business Machines Corporation



MICROSOFT BASIC V2.0 AND MACPASCAL INTERPRETERS — an Evaluation

BY KAY FIELDEN

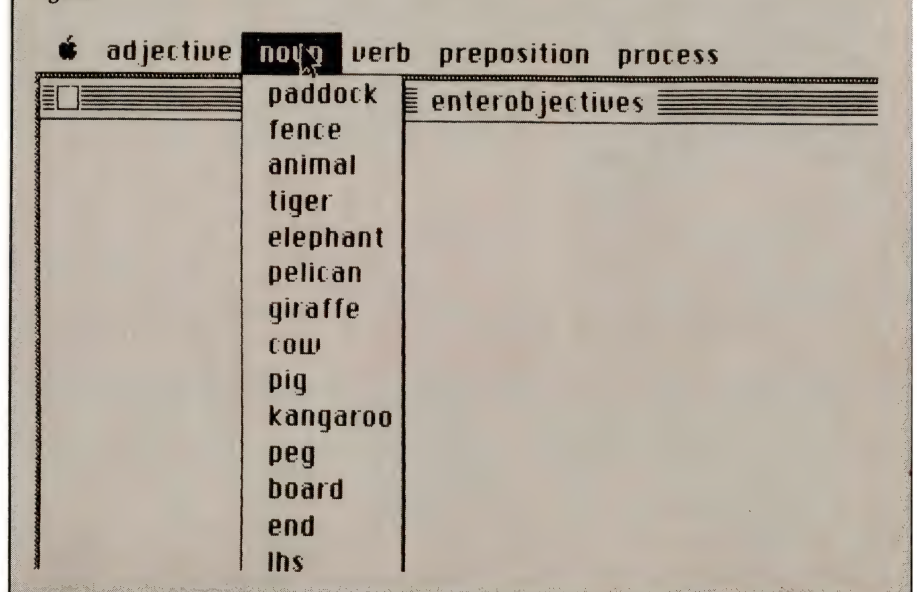
Undertaking a research project based on the Macintosh that requires substantial programs to provide graphic interaction with users, plus the design of a help facility based on menus, is no easy task. It was necessary first to evaluate the most suitable programming tool — MacPascal or Microsoft BASIC V2.0. We thought readers would be interested in the results of this comparison.

Both MacPascal and Microsoft BASIC are menu-driven under mouse control; they have good debugging facilities, excellent text editors, and facilities supported within the language for sub-programs, functions, repetition and decision control. Both also provide a good environment for modular programming. The control structures of Pascal are a little better, but both languages are easy to implement and provide clear code.

Neither fits in with the traditional view of Pascal or BASIC. The most apparent differences from these languages as we know them are: the access to graphics facilities via the Quickdraw ROM routines; multiple windows during the running of a program for text output, graphics output, the program list and interpretive debugging via the step function in Pascal; and the absence of line numbers, the use of non-numeric labels and the sub-program facility with parameter passing in BASIC.

A deeper look at the languages shows

Figure 1.



MICROSOFT BASIC VS MACPASCAL

they have different facilities to offer concerning data structures, runtime facilities, program units, management (mouse control, keyboard control, menu control, button control), graphics facilities, window management, dialogue control, edit fields and file access.

Data Structures

The data structures of Standard Pascal are far superior to any BASIC; it's always possible to model the real-world situation closely with Pascal data structures because of their inherent flexibility. MacPascal data structures are enhanced by adding long integers, double-precision reals, strings and handles to Standard Pascal. (Handles are pointers to pointers used extensively for graphics manipulation, event management and memory management.)

Microsoft BASIC V2.0 has only one structured data type — the array. This makes manipulation of the data more cumbersome, as well as creating data structures which bear little relationship to the inherent structures of the problem at hand.

Consider, for example, the following Pascal data structure:

```
type
basestructure = record
  angle : integer ;
  vx, vy : integer ;
  radius : integer ;
  maxcno : integer ;
  connectedto : array [1..10] of integer ;
end;
```

```
treenodetype = record
  vertex : array [1..20] of basestructure;
  maxvno : integer ;
  downptr, rightptr, levelno : integer ;
end;
var
  tree : array [1..20] of treenodetype;
```

To represent these data structures in BASIC one possibility is:

```
DEFINT n-t
DEFSTR h
DIM nodevertexangle(20,20), nodevertexx(20,20), nodevertexy(20,20),
  noderadius(20,20), nodemaxcno(20,20), nodeconnectedto(20,20,10),
  nodevertexno(20), noderightptr(20), nodeleftptr(20), nodeprevptr(20),
  nodeheadptr(20), nodedeviatemoves(20), hints(20,3), nodemaxhintno(20),
  nodeonsolnpath(20)
```

Pascal seems to represent the real-world structure more closely and enables less cumbersome processing.

Runtime Facilities

MacPascal always gives three windows when you open the file: the program listing, a text window and a graphics window. When 'Run' is selected from the menu the window arrangement can be changed under program control.

However, BASIC V2.0 throws up the runtime window as soon as a program file is opened if the file has been saved in compressed form — a decided advantage in writing applications on the Macintosh. BASIC doesn't differentiate between text

and drawing windows.

Program Units

The only units allowed on MacPascal are the provided libraries or Quickdraw, and program size is limited to 1000 lines (5120 words) — a severe restriction on any application being developed.

Microsoft BASIC V2.0 allows programs to be chained. The calling program can chain part or all of a program, and can

overlay chained units to conserve memory space.

Event Management

Limited event management is possible in MacPascal, but can be extended by calling the in-line routines, which call on the ROM toolbox traps. Their use is unsupported within Pascal, and the documentation describing the use of these routines comes with the dire message "WARNING — Using this facility carelessly or erroneously can be fatal to your disk or data."

This is certainly the case; an error in a toolbox call at the very least usually results in the loss of the current workfile and at worst corrupts the system disk. When the toolbox calls are invoked all type checking ►

Listing 1.

```
GOSUB setupmenus                                     processprep,processcontrol

setupmenus.
  MENU 1,0,1,"adjective"
  MENU 2,0,1,"noun"
  MENU 3,0,1,"verb"
  MENU 4,0,1,"preposition"
  MENU 5,0,1,"process"

  MENU 2,1,1,"paddock"
  MENU 2,2,1,"fence"
  . . .
  MENU 5,2,1,"Quit process"

RETURN

ON MENU GOSUB menucheck

menucheck
  menunumber = MENU(0)
  ON menunumber GOSUB processadj,processnoun,processverb,

                                     processprep,processcontrol

RETURN
  processadj
  adjmenuitem = MENU(1)
  FOR i = 1 TO adjmenuitem

      NEXT i

RETURN
  processnoun:                                     'enter appropriate action
  processverb:
  processprep:
  processcontrol:
  controlmenuitem = MENU(1)
  ON controlmenuitem GOSUB enterobjective,quitprocess

RETURN
  enterobjective                                     'enter appropriate action

  quitprocess                                       'enter appropriate action
```


MICROSOFT BASIC VS MACPASCAL

and parameter checking are disabled.

In Microsoft BASIC V2.0 extensive event management is provided and supported within the language. There is program control over the mouse, the menu, the keyboard, dialogue boxes and button control. (See Listing 1 for an example of a typical code to set up and trap menu queries in BASIC. Figure 1 shows what appears when this code is run.)

Pascal requires approximately twice as much code as BASIC. This code isn't as straightforward and is further complicated by the use of frequent calls to in-line functions, which are unsupported within Pascal. The BASIC event handling is clearer because the constructs are inherently simpler, and it's more reliable because it is supported within the language.

Graphic Facilities

MacPascal has an extensive Quickdraw library which allows graphic manipulation of complex graphic functions. The fundamental unit is a rectangle defined by the top left and bottom right co-ordinates. All graphic objects (except line and point) have a rectangle associated with them.

Besides allowing you to draw the object on the screen, there is also a collection of routines which manipulate these objects mathematically within Pascal. However, it appears there are still many bugs within the Quickdraw library.

Microsoft BASIC V2.0 has limited access to the Quickdraw library; there is support for the screen drawing facilities with the simpler objects such as points, lines, rectangles, ovals, arcs and polygons. Pascal allows regions and pictures as well, while BASIC doesn't have any of these mathematical routines.

Microsoft BASIC V2.0 also has its own graphic routines, such as CLS, PICTURE and LINE. PICTURE is analogous to the 'region' of Pascal, although it is limited in its manipulation.

In BASIC it's possible to dump the screen to the printer using LCOPY. Figure 2 shows a sample screen dump.

This operation is more cumbersome in Pascal. The picture can be saved using Savedrawing ('name of drawing'), which is accessible via MacPaint by opening MacPaint, closing the file, then selecting 'open' from the file menu. This throws up a dialogue box from which you can select the file saved with Savedrawing. It's then possible to dump the screen output to the printer.

It's also possible to access ROM routines for graphics with the in-line

routines via Pascal. At present this doesn't seem possible with BASIC.

Window Management

Window management, like menu management, is very simple in Microsoft BASIC. The constructs supplied within the language are straightforward and easy to use, and it's possible to declare up to four output windows and transfer control between them. For example, the sequence below sets up an output window in BASIC.

```
WINDOW 1,"name of output window 1",(5,170)-(250,280),1
```

```
WINDOW OUTPUT 1      'directs output to window 1
                      'any screen output will appear on this window
```

```
WINDOW CLOSE 1
WINDOW OUTPUT 2      any further output will be directed to window
2
```

Window manipulation is possible in Pascal via the Toolbox routines but, like the menu routines, they are very cumbersome. One advantage of BASIC is it doesn't differentiate between a text window and a drawing window as Pascal does; it isn't possible to show text input on the drawing window in Pascal directly. Often only one window and text input is required; because BASIC doesn't differentiate, this problem is non-existent.

Dialogue Box Control

Dialogue boxes can be set up within BASIC using a combination of windows, buttons and edit fields. These can then be interrogated by using ON DIALOG with a selection of actions, such as in Figure 3, depending on the state of the window, buttons, edit fields and so forth.

The only way to set up dialogue boxes in Pascal is via the Toolbox routines, which have the same problems as the other Toolbox routines.

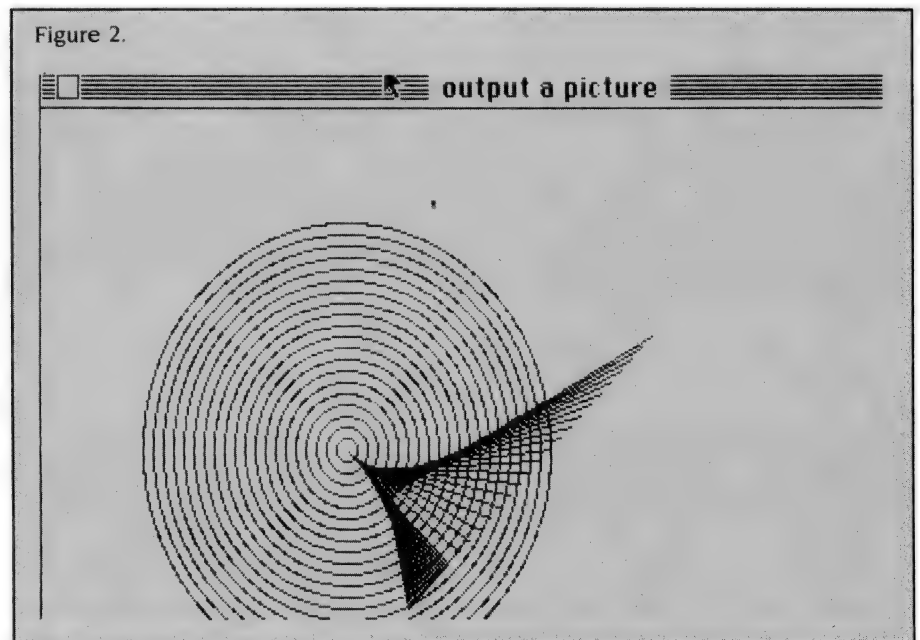
Edit Fields

Only BASIC has the facility to set up a form on the screen via its edit fields. Data can then be entered in any order on the screen and corrected and deleted, until the screen is fit to send to the appropriate process or file. Pascal doesn't offer this feature.

File Access

MacPascal allows sequential files access to textfiles and files of records. It has limited facilities to look at specific compo-

Figure 2.



MICROSOFT BASIC VS MACPASCAL

nents within a file by the use of 'seek' and 'filepos'.

Microsoft BASIC allows sequential and random file access. Numeric fields within a random file must first be converted to strings with the functions MKIS, MKSS and MKDS to be stored on file, then recon-

verted to the appropriate numeric value with CVI, CVS or CVD on retrieval from a random file.

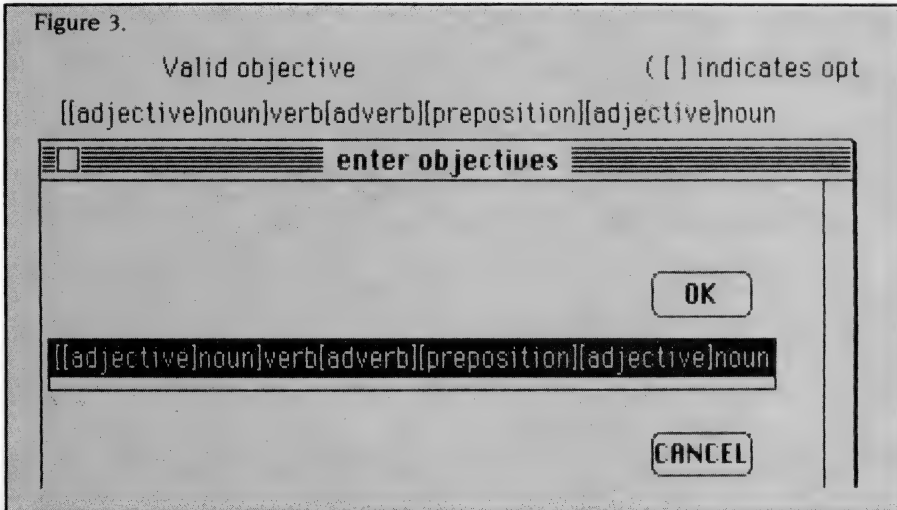
Conclusions

After evaluating Microsoft BASIC and Mac-

Pascal for our research project, we came to the conclusion that Microsoft BASIC has more to offer for development of such applications, although it's restricted in its use of the Toolbox and has less to offer with respect to data structures, dynamic variables and block structuring within the language. The Toolbox ROM routines aren't supported within MacPascal and attempts to use them can cause a lot of damage; and when a researcher or programmer is new to a system, these routines will inevitably be used incorrectly.

The use of pulldown menus, dialogue boxes, buttons, edit fields and windows (all of which are supported within Microsoft BASIC), together with the ability to emulate a turnkey system, offers a better application development environment. BASIC also offers the ability to chain programs, and to load and execute one program from within another.

Microsoft BASIC'S sophisticated approach to providing a friendly user interface was the final deciding factor in this project. □



BEEARTISTIC.

You have a choice of drawing tools: pencil, brush, spray-can, fill can, eraser.

Draw points, lines, boxes, ellipses or handcrafted drawings.

User-definable patterns – defined areas may be filled or you may brush them on. Text and graphics can be combined; perfect for overhead projector artwork, etc.

"Cut & Paste" facility. Define your own icons and copy them.

Zoom editing – allows you to edit your art in fine detail.

Pictures can be saved on or retrieved from disk, or printed out.

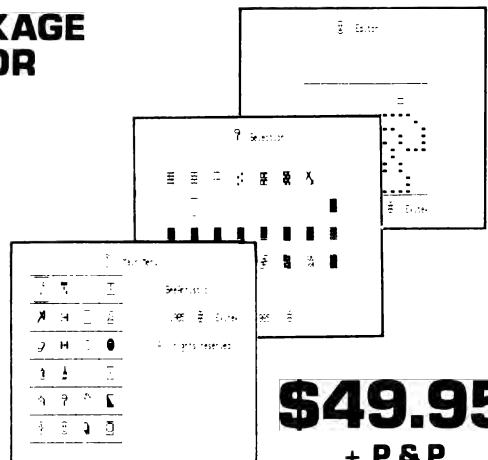
BEESLIDE – a variable speed slide-show package; user defined order and files.

Min. Requirements: 32k Microbee, CP/M, 1 disk drive (40 track DSDD), Epson compatible printer (option).

**THE ONLY
GRAPHICS PACKAGE
AVAILABLE FOR
THE
MICROBEE**

**DESIGNED
AND
DEVELOPED
IN
AUSTRALIA**

A FEW MENUS



**\$49.95
+ P & P**

I want to BEEARTISTIC too!

Cheque ☐ Bankcard ☐ Mastercard ☐ VISA ☐

BEEARTISTIC Packages @ \$49.95

Postage and Packaging @ \$3.50

NAME: SIGNATURE: EXP: /

ADDRESS: STATE P/CODE

EXITEK

P.O. Box 348, Balwyn North, Victoria.
Australia. 3104. (03) 846 3500

SON OF ZARDAX

With sales of the Zardax I word processor breaking the 8000 mark worldwide, Computer Solutions has now come up with some stiff competition for Appleworks: the ProDOS-based Zardax WP11. Richard Walding, who assisted in the pre-release trialling of the new Zardax, puts it through its paces.

ZARDAX WP11 is more than just a ProDOS version of the original Zardax word processing program; while the philosophy behind it may be the same, the procedures and processes are different.

The father of Zardax, Ian Phillips, once described his major aim in developing a word processing package as "keeping it simple" (*Your Computer*, Jan 1985). He has stuck to his guns with the WP11, and it's still user-friendly and abounding with features.

Zardax I was written in BASIC and Assembler, while the new Zardax WP11 has been written mostly in C. It occupies 70 Kbytes of disk space and requires a 128 Kbyte Apple IIc or IIe with extended 80-column card to run it.

Up And Running

At start-up, Zardax WP11 will ask for the current time, unless the clock card is present, in which case the time will be displayed automatically. While Zardax I opened with a menu, Zardax WP11 takes you straight into a new document. Hit Escape and you move into the main menu where Video (which shows you what the formatted document will look like when printed), Save, Rename and Write (for writing a 'videoprint' image to file) are found. There are also the commands Info (reports memory usage), File (selects the file menu), Edit (edit menu), Print (print menu) and List (list menu).

Pressing Escape takes you back to the document in memory rather than to the

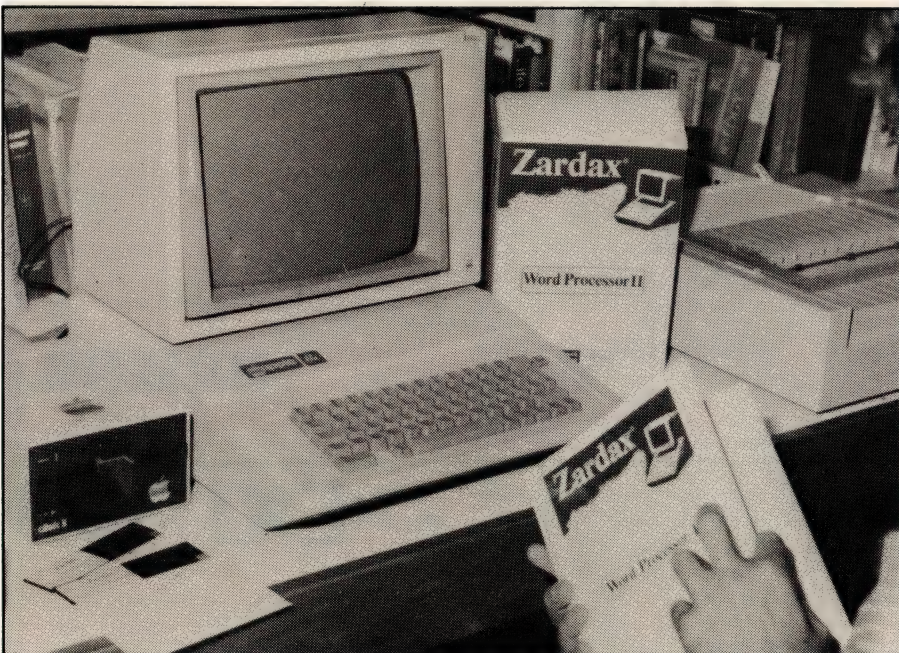
main menu, which can be a bit unnerving if you're used to Zardax I, but after a while you realise it saves keystrokes.

- **The File Menu:** has the commands Insert (a file from the disk), Rename, Delete, Lock, Unlock, New (select an existing document or list or create one), Format (profile hard disk or floppy), Make (a subdirectory), Gloss (load a Glossary file), Copy, Volume (select a drive) and Quit.
- **The Edit Menu:** inspired by the Apple Lisa, this menu has four options and is used to control a clipboard. The clipboard is a temporary storage space used for removing text from a document by cutting. Items in the clipboard can be placed in a document using a paste command, which won't alter the clipboard contents. It's also possible to save a copy of the clipboard to disk.

Keyboard editing is extensive: Zardax WP11 has a search facility as well as search and replace.

If a range of documents requires the same formats, the Glossary feature allows the entire format to be predefined and stored as a file, which is called up at the beginning of each new document. Documents can also contain commentary text for the author and operator, which is not printed. The Glossary is a file of up to 26 items which contains several lines of text and print start-up. Other Glossary files may be stored on disk and swapped for the start-up version using the file menu.

- **The Print Menu:** Zardax WP11 can use a variety of printers by selecting an appropriate printer parameter (from the print menu) from those supplied with the package.



- **The List Menu:** a list of file managers such as names, addresses and telephone numbers. Up to 1000 records can be created, sorted, displayed, edited and merged with a document.

Formatting

The extensive print formatting commands are similar to those in Zardax I, with some name changes and additions. Commands are embedded into the text with a control A, and you can specify font, colour and country character set. All the old commands remain: headers, footers, justification, proportional spacing, indentation, margins, tabbing, page length, centring, pitch, line spacing, sub/superscripts, italics, bold, underline and condensed (now called 'thin').

The Bad Points

Zardax requires the entire document to be resident in memory, so large documents have to be made up of several smaller ones linked together with the Queue Link command. The Queue Link maintains page

The extensive print formatting commands are similar to those in Zardax I, with some name changes and additions. Commands are embedded into the text with a control A, and you can specify font, colour and country character set.

numbering, but not headers, footers or the initial formatting commands; and it doesn't enable you to skip from one point to the other while editing.

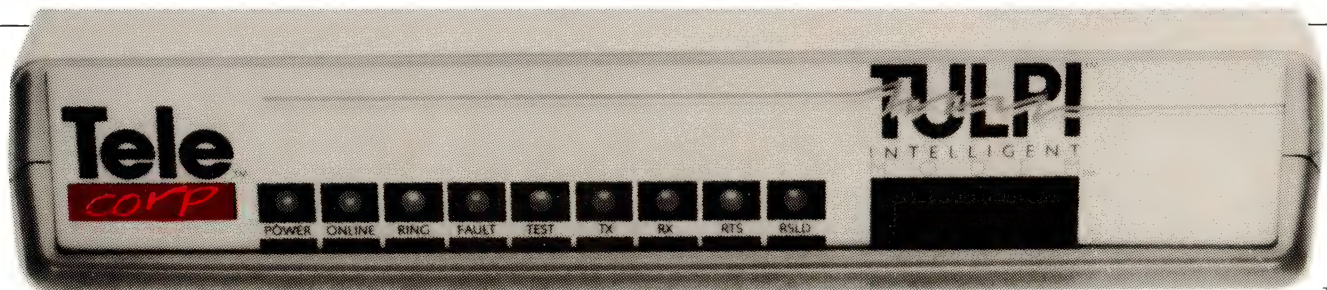
A utility program, WP2.CONVERT (on WP.TOOLS disk), converts documents pre-

pared under Zardax I to a form which can be used by Zardax WP2. However, as the manual points out, it's not 100 per cent foolproof: it won't convert any of the old Z commands such as Bold, Italics and Condensed; it fails to turn off a subscript or superscript with some printers; and it doesn't account for the fact that the old default left margin was zero while the new one is 10.

The original Zardax Draft command, which lets the user print a copy of the document in memory without having to save first, and the Index command, which prints out the names of all the textfiles on disk, are missing; and because printing is done from a disk file rather than from memory, the keyboard can't be used during printing.

Upgrading

Upgrading Zardax I to WP2 will cost \$100, including the disks (original plus backup), manual and WP2.TOOLS disk. You're given a dual licence and keep the Zardax I package. At this price it's a bargain. □



The Tulpi INTELLIGENT MODEMTM

LIKE NO OTHER MODEMSM

TulpiTM is a state of the art microprocessor controlled, Intelligent Modem
Tulpi incorporates all of the necessary features for users of videotex and standard databases.

- **Automatic dialling,** pulse and tone.
- **Self contained communications firmware.** Integrated command structure allows the user to set mode, baud rate and data format. Line side and user side configurations may be independent.
- **Automatic answering** featuring our exclusive 'Sleep Answer' mode.
- **Universal speed up buffering and bit rate conversion** which allows CPU to function at high baud rates. Tulpi manages the split baud rates and buffering. This enables all PCs and 'Dumb Terminals' to access Viatel without the need for bit rate converters.

- **Exclusive LongLineTM circuitry** maximizes the integrity of data in country areas where the Telecom lines are long and often noisy. This also improves noisy city exchanges too.
- **V21 and V23 modes 1 and 2** connection optimised to Australian Telecom's protocol. Also Bell 202.
- **No Switches.** All of Tulpi's commands are accessible from the terminal devices keyboard or host computer.
- **Automatic powerup default configuration** for virtually unlimited system flexibility in private line, exchange line or direct wired environments.

- **8K PROM and 16K RAM (optional) for industrial process control and surveillance programming.** Perfect for remote non keyboard devices.
- **8085 processor.**

For further information and the name of your nearest dealer contact:

Tele corp

Telecorp Pty Ltd.
8/21 Tepko Road,
PO Box 236. Terrey Hills
NSW 2084 Australia.
(02) 450 2522.

Dealer and O.E.M. enquiries welcome.

Telecorp P/L 1985 YC/10/85



By the time a
conventional PC
network has
done this much
paperwork,

the new Corona
Mega PC
will have done
all this.

To find out how the new Corona Mega PC works twice as fast, yet costs less, please send for our brochure.

Name _____ Position _____

Company _____ Address _____

Postcode _____ Telephone _____



AWA COMPUTERS

132 Arthur Street, North Sydney NSW 2060

TOSHIBA 1500

THE TOSHIBA 1500

*Our most compatible
Frank Lee wades deeper
into the clone jungle with
this latest Japanese
'Me-Too' machine.*



NOT SO LONG AGO I reviewed the T1500's little brother, the Toshiba T1100. This was a lightweight, battery-operated portable computer with a full 25-line liquid crystal display and very good IBM PC compatibility. The T1100 scored well in the evaluation, as does the T1500, with one misgiving — price. It's not cheap, but the value-for-money ratio isn't bad. As you'll see, this machine has class and character, as well as excellent compatibility.

Although PC compatibles are relatively popular in Australia, the IBM PC itself still has the lion's share of the market. The IBM package is generally more expensive, but there's more to the 'real thing' than just the IBM logo. In particular, IBM's support structure in the areas of technical advice, servicing and education are its major advantages. These 'intangibles' often swing buyers, particularly those of a corporate nature, towards Big Blue.

To wander with an open cheque book in clone jungle is another matter altogether. This is no playground for the naive. There are prizes, but you may find yourself surrounded by less than helpful denizens of its dark recesses. You'll need to arm yourself with a heavy dose of self-education and acquire a taste for adventure. The less adventure you seek, the higher the price you pay up front.

There are also intangible components of that price. What happens if the company manufacturing or importing the compatible goes under? Is there a capable, fully equipped service and maintenance team? Is the company committed to the product? Can it provide hands-on education?

This is an area in which a large organisa-

It's not cheap, but the value-for-money ratio isn't bad. As you'll see, this machine has class and character, as well as excellent compatibility.

tion such as Toshiba can offer more than its smaller competitors. Its size is a major advantage, although it is microscopic in comparison with IBM.

I think I'm in danger of being type-cast as an evaluator of IBM compatibles. What a fate! It's a bit like being one of the judges on *New Faces* — you're always in danger of getting egg on your own face.

In past months quite a few clones have passed through the portals of Mount Crisis. Some have even stayed to dinner and become members of the family.

I've explained my philosophy on clone evaluation in previous articles. Briefly, there are levels of compatibility. At the highest level you should be able to run all the popular programs written specifically for the IBM PC, with the exception of those which make (improper) use of the PC's ROM code by directly addressing that code. The machine must also be capable of expansion, using boards designed for use on a PC. In many cases, the hardware compatibility isn't a significant issue.

The Toshiba T1500 is about as compati-

ble as you can get without infringing copyright. For starters, it runs that test *par excellence* — the Microsoft Flight Simulator. But first ...

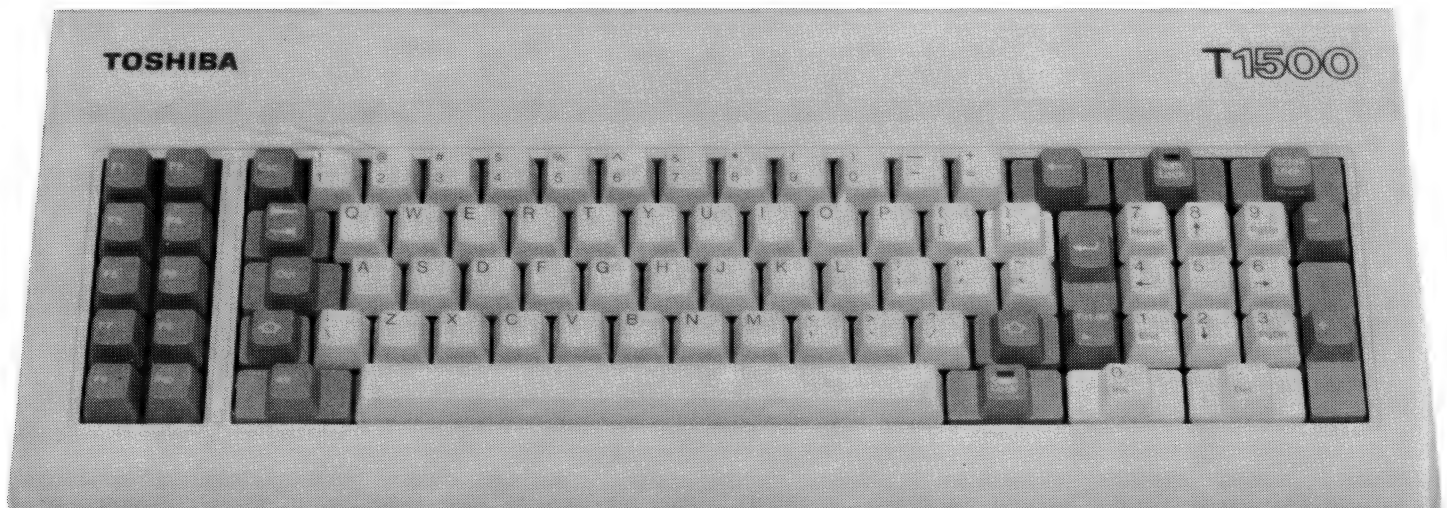
Pre-power-up Observations

The T1500 is conventionally but soundly packaged and presented. It comes in three boxes: the main unit, the keyboard and a monitor. A smaller box contains the 'system kit', consisting of the three manuals and two floppy disks. It astounds me that this is sold as an optional extra, since the machine does absolutely nothing without MS-DOS. No doubt it could be obtained from a third party, but not so the T1500 manual. Furthermore, the price of the system kit is \$95 — quite a lot to pay for three unbound books and two floppies.

The system sent to us for evaluation contained one Toshiba half-height floppy disk drive, an NEC half-height 10 Mbyte hard disk and 128 Kbytes of memory. The side mounting of the additional cards and the side-by-side positioning of the two drives give the unit a shallower, cleaner look; it measures 45 cm by 36 cm, is 10 cm high and weighs in at just on 10 kg.

Removing the outer case merely requires a screwdriver. *Sans* case, the unit presents as an extremely well-designed machine. The front escutcheon looks great, and so does the Toshiba RGB monitor mounted on its tilt-and-swivel base.

The inside of the box is an electronics engineer's joy. It's mechanically solid, neat and carefully planned. There's a large system board covering roughly two thirds of the floor area, and a small extension board carrying the standard IBM slots is



INTRODUCING THE WORLD'S FIRST DUAL HEADED PRINTER

Now Brother gives you two machines for the price of one.

Daisy Wheel or Dot Matrix, the choice is yours in the revolutionary new Twinwriter 5.

For \$1995.00 it will deliver 36 cps letter quality daisy wheel print, and 140 cps dot matrix type and graphics — more efficiently and much more economically than any other two machines you can name. The Twinwriter can put you around \$1000 in front, save you valuable time and will only take up half the space.

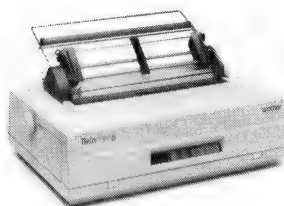
Brother's breakthrough dual printhead technology means you can now produce daisy wheel quality copy and dot matrix graphics in the same document. At the push of a button — or through software driven commands.

Other features include:

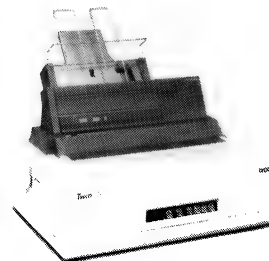
- 3K byte buffer (optional 11K or 19K byte)
- 136 columns
- 420 cms (16.5 inches) paper width
- Centronics Interface with optional RS-232C converter
- Interchangeable daisy wheel cassettes.

Plus a range of cost efficient options.

This highly versatile printer can be made even more efficient but with the addition of a cut-sheet or tractor feeder. Brother are recognised as the experts in printer productivity and we know you'll soon recognise the cost benefits of these invaluable accessories.



TF-300
TRACTOR FEEDER
\$189 r.r.p.



CF-300
CUT-SHEET FEEDER
\$449 r.r.p.

The new Brother Twinwriter 5. Two of the best printers money can buy. In one beautiful package.



brother®
Value that speaks for itself.

7-9 Khartoum Road North Ryde NSW 2113

SYDNEY (02) 887 4344 • MELBOURNE (03) 873 3655 • BRISBANE (07) 52 5257 • ADELAIDE (08) 42 6373 • PERTH (09) 478 1955.

CSO 1360

mounted vertically to the system board, supporting up to three additional plug-in cards which mount sideways. One slot was used by the hard disk controller.

Fortunately you're not likely to need more than the spare two slots; there's quite a bit packed into the system board. You can see at least one PLA (programmed logic array) on the system board, indicating there's been a considerable reduction in the chip count. One empty chip socket is reserved for the optional 8087 maths co-processor. Sadly, there's no on-board provision for a battery-backed calendar clock chip, and neither is there a 'hard' reset switch. You really do need a reset switch, even though there's none on the IBM PC, as sometimes the 'soft' reset method (pressing the Alt-Ctrl-Del keys together) just doesn't work, forcing you to do a momentary power-down.

System board features more frequently found on plug-in cards in other computers include the RGB monitor logic, LCD logic, parallel port and RAM capacity up to 640 Kbytes. Options requiring slots include a medium-resolution monochrome display adaptor (for the IBM monochrome display) and an asynchronous communications adaptor (serial port). It's a pity the latter is only an option when you consider the current interest in communications.

All the slots are compatible with IBM cards. Placement of the card system has borne in mind the need for effective ventilation; a quiet fan in the 150 watt power supply cools both the supply and the heat-generating components of the machine.

The Toshiba half-height floppy disk drive is quiet, and judging from the clicks it has a head-lift solenoid. When the drive is selected, the printed circuit motor spins and the read/write head is brought into contact with the spinning disk surface. Unfortunately, not too many half-height drives have this excellent feature, leaving them prone to writing accidental data in the event of a power glitch.

Another nice feature of the floppy disk drive is an external slide switch which effectively write-protects the disk. It's a kind of additional insurance policy.

The Toshiba-manufactured keyboard follows pretty much the same layout as the IBM PC. It's IBM plug-compatible, has tilting legs for adjusting the angle, and features two LEDs which indicate the status of the Caps Lock and Num Lock keys. The feel is a bit soft, and there's no special acoustic or tactile feedback. I still prefer the feel of the Keytronics board, which has

*I think I'm in danger of
being type-cast as an
evaluator of IBM
compatibles. What a fate!
It's a bit like being one of
the judges on New
Faces — you're always
in danger of getting
egg on your own face.*

a bump in the resistance force at the point where the key data has been transmitted. Nonetheless, the Toshiba keyboard would be adequate for even a fussy typist.

The monitor supplied with the system was an RGBI-type, with excellent resolution, a tilt/pan base assembly and a separate cable to link it with the RGB output socket. As there's no power socket on the rear of the T1500, you'll need a second outlet for the monitor. You can also use a composite colour or monochrome monitor with the separate socket for composite video (NTSC). The monitor connections are all standard IBM. Although it wasn't provided for evaluation, I understand you can also use a flat-screen 25-line LCD as a substitute for the conventional monochrome or RGB monitors. This could be an interesting alternative, as it would significantly reduce the overall weight of the system and make it much easier to transport. I suspect the LCD screen is the same as the one used in the portable T1100.

Documentation and System Software

The documentation provided with the system kit consists of three shrink-wrapped manuals pre-punched for a three-ring binder which measure 14 cm by 22 cm. You'll need to provide your own binders unless you're happy with the thinly glued spine.

Two of the manuals are more or less of Microsoft origin. These are the BASIC Reference Manual and the MS-DOS Reference Manual. No surprises here. A thinner Owner's Manual (131 pages) covers setting up the computer, initial operation, trouble-shooting, introduction to MS-DOS and how to install the options. It's written with a tinge of Jenglish, and while adequate for

the average user, this isn't intended as a complete technical manual.

Two floppy disks are supplied with the system kit. One is the 'system disk', containing MS-DOS 2.1 and BASIC 1.1. Apart from the normally supplied DOS utilities there's a VDISK.SYS which allows you to nominate a RAM disk size via your CONFIG.SYS file. This can be a real bonus if you have scads of RAM and a variety of directories scattered around.

The second disk is labelled 'Diagnostics', and includes an AUTOEXEC.BAT file which invokes a general-purpose diagnostic program. I've seen this program before in slightly differing guises; it includes utilities for formatting and parking the hard disk.

Power-on Tests

The T1500 is not a quiet machine. The fan generates a fair bit of noise, but it certainly isn't objectionable.

I tried the various diagnostic routines, and in the process formatted the hard disk and set it to auto-boot DOS on power-up. I copied the whole system and diagnostic disk contents to the hard disk, and it worked just fine.

The first test was to run the Microsoft Flight Simulator, which flew like a bird. In fact, I had no problems with any of the usual packages, which included Open Access, Wordstar, Lotus 1-2-3 and Sidekick.

My standard prime number crunching benchmark program compiled and executed in the same time as the IBM PC/XT, but the T1500 has a very slight edge in hard disk dominated activities.

Each clone supplier is required to make minor modifications to Microsoft BASIC in order for it to run in the machine's environment. Sometimes this involves the omission of certain functions; in the 1500's case I couldn't find any shortcomings or oddball behaviour patterns.

I found the same set of utilities that were included with the smaller T1100. In particular, the RAM disk utility VDISK is a great asset; frankly, I now couldn't cope without a similar utility on Ron (my President 16-210). With a total of 512 Kbytes, I allocate just enough RAM disk space to hold the three main Wordstar files and BASICA. These files reside on 'drive' D after being copied there by an AUTOEXEC.BAT startup file. By having Wordstar there, I don't need to have copies of that program in each subdirectory from which I need services. Instead, I leave a short file, W.BAT, in the root directory of the hard

MEET THE BROTHER M1509 HIGH-SPEED DOT MATRIX PRINTER

This new printer is not only very fast and very quiet, it's also very inexpensive.

At \$799, 180cps and 136 columns it will out value and out pace any rival.

And because of its extremely low noise level it will fit peacefully into any office environment.

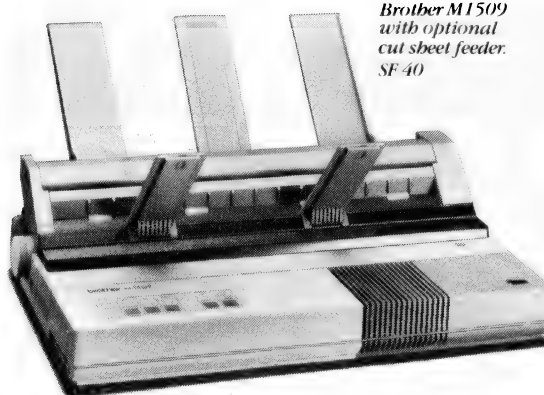
Brother have built a reputation for innovation, design excellence and proven reliability and we have put them all together in this exceptional machine.

Consider these features and see if you can find better value,

- High Speed output (180cps), Near Letter Quality printing (45cps)
- Big 3K byte buffer memory.
- Dual Interface (Centronics, RS232C)
- IBM plus Epsom Compatibility built-in.
- Optional cut-sheet feeder.
- Compact and lightweight.
- Optional NLQ font board available (LQ-200)
- High Density Charts and Graphics Printing

Accessories that further enhance cost efficiency.

Brother printers deliver exceptional value-for-money and when you add the time and cost saving benefits of the optional cut-sheet feeder, it's obvious why the Brother printer accessory package has got business people in raptures.



*Brother M1509
with optional
cut sheet feeder.
SF-40*



brother®
Value that speaks for itself.

7-9 Khartoum Road North Ryde NSW 2113

SYDNEY (02) 887 4344 • MELBOURNE (03) 873 3655 • BRISBANE (07) 52 5257 • ADELAIDE (08) 42 6373 • PERTH (09) 478 1955.

CSO 4360 B

BACK UP YOUR DISKS

\$98.95

plus \$2.00 postage & packaging

ESSENTIAL DATA DUPLICATOR III™

EDD runs on Apple II, II plus, IIc and Apple III (in emulation mode) using one or two disk drives. EDD allows you to easily and quickly make back up copies of your "uncopyable" Apple disks.

Since EDD has been preset to copy the widest range of copy-protections possible, you just simply boot up EDD, put the disk you want to copy in one disk drive and a blank disk in the other (EDD will work using one drive also) and in about 2 1/2 minutes a copy is made.

Unlike the "copy-cards" which only copy "single load" programs, EDD copies the entire disk.

This would be similar to hooking up two cassette recorders, playing from one, and recording to the other.

We have even included an option so you can check the speed of your disk drives because drive speeds running fast or slow can damage disks and cause other problems.

We publish EDD program lists (information about copy-protected disks) every couple of months, which EDD owners can receive. The current list is included with the purchase of EDD.

The bottom line is this; if EDD can't copy it, chances are nothing will.

Warning: EDD is sold for the sole purpose of making archival copies ONLY.

To order your copy send cheque or money order to UTILCO SOFTWARE 83 Hall Street, Bondi Beach, NSW 2026 AUSTRALIA. Telephone (02) 30 2105



Order by phone:



LIGHT PEN

Compatible with
IBM PC, XT, AT,
and most IBM COMPATIBLES
AST, PERSYST and
HERCULES
LOTUS 123, SYMPHONY,
any MOUSE software.

TOTAL SOLUTIONS

10/281 Pacific Highway North Sydney 2060
Telephone (02) 923 2466

Electronics Today

ONLY \$2.75
N.Z. \$3.50

Electronics Today is Australia's dynamic electronics monthly. It has more special features, new and exciting projects to build and a wealth of information on components, equipment and new technology. Regular features include Australia's top hi-fi reviews and news on communications and computing. Buy your copy now from your local newsagent, or become a subscriber and have the magazine home delivered. Only \$27.00 for 12 issues.

Send your cheque to:
Subscriptions Department
Federal Publishing
P.O. Box 227
Waterloo, N.S.W. 2017

TOSHIBA 1500

disk (C), which contains the following:

D:
WS C:%I
C:

To edit a file in a subdirectory, I just enter that directory (with the CD command), then use 'W' instead of 'WS'. After leaving Wordstar, the batch file logs back into the subdirectory.

Conclusions

The T1500 is an elegant piece of hardware, but it isn't cheap. On the other hand, the machine is superbly designed and constructed, and that kind of engineering does not come lightly. Unfortunately, the prices are boosted by the price of the monitors. I understand Toshiba (Australia) is examining the possibility of finding an alternative source for monitors in order to redress the problem. Intending purchasers might well be advised to check first to see if they really need the Toshiba monitor, or if they could do better from another supplier. The monitors are strictly IBM PC compatible.

Here are the current prices for some sample 128 Kbyte configurations:

1. Two floppy disk drives and monochrome screen: \$3950. As (1), but substitute a hard disk for one floppy: \$6150. System kit: \$95.

To find out the cost of a system with an RGB monitor, deduct the cost of the monochrome monitor (\$552) and add the

cost of the RGB monitor (\$1150). Told you they weren't cheap.

Worst point: Pricing (unbundled necessities)

Best points: Engineering quality, level of compatibility, slim lines. ☐

RATINGS:	POOR	GOOD	V. GOOD	EXCELLENT
VALUE FOR MONEY	<div></div>			
APPEARANCE	<div></div>			
RELIABILITY	<div></div>			
SUPPORT	<div></div>			
EASE OF SERVICING	<div></div>			
DOCUMENTATION	<div></div>			

MORROW'S PIVOT II The portable which acts like a desktop

The Pivot II is the first battery-operated portable computer that runs any software written for the IBM PC. You no longer lose anything when you leave your IBM PC on your desk at work and carry your portable home.

The Morrow Pivot II comes with:

- * 1 or 2 360 Kbyte 5¼" floppy disk drives

- * A minimum of 256 Kbytes RAM

- * A 25-line display featuring advanced technology which provides legibility under any lighting conditions

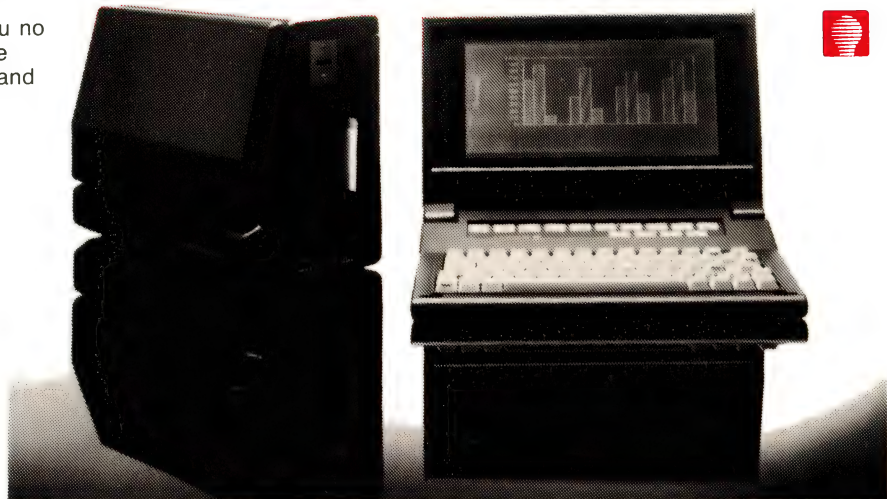
- * RGB and composite video output

- * IBM PC expansion bus connection, so you can plug in to a whole range of boards and options giving you the full-functionality of a desk-top PC

Software included with the Pivot is the industry-standard MS-DOS 2.11 operating system, the Newword word processor and personal utility software built into the unit's 32-Kbyte ROM.

All this power is packed into an attractive unit measuring 33 by 15 by 24 cms and weighing less than 6 kg with two disk drives!

Portable computer technology has reached maturity — the Pivot II is the proof



Distributed in Australia by:

**AUTOMATION
STATHAM Pty Ltd**

47 Birch Street, Bankstown
NSW 2200. (02) 709 4144 Telex. AA73316

A FULL SERVICE MORROW DISTRIBUTOR SINCE 1976

Also available from:
MULTI FLEX SERVICE
249-251 Pitt St.,
Sydney, NSW 2000
(02) 276-9336

COMPTETRON
252 Abbotsford Rd.,
Mayne, Qld 4006
(07) 52 9522

Introducing the Sinclair QL. A Quantum Leap in Small Business Computers.

In today's business world, just keeping a step ahead is often not enough.

The difference between success and failure can depend upon your ability to see far into the future, to anticipate needs and calculate costs. That's why the personal computer has become one of the most important tools in business. A good one can help you understand what lies ahead.

But personal computers having the capacity to really help have two major drawbacks.

They cost a fortune and usually are so complex to operate that weeks and even months of study are required before they can become functional.

No longer.

Now there's the Sinclair QL (Quantum Leap). It's not just the next step in

business computers but quite literally a quantum leap in terms of design, capacity and price.

This is a machine that will keep you current for years to come.

The Sinclair QL is

powerful.

It combines a 32-bit processing capability with 128 K's of RAM. And QL has a wide range of available software programming. In fact, over \$1000 worth of these programmes are included free within each package to get you started—word processing, financial models, graphics and information

storage. And the QL is designed to work so simply that you can start using it immediately. Within

minutes the QL can be fully operational, making valuable

contributions to your business. Yet don't be fooled.

Even the most demanding users will probably never fully tax its capacity.

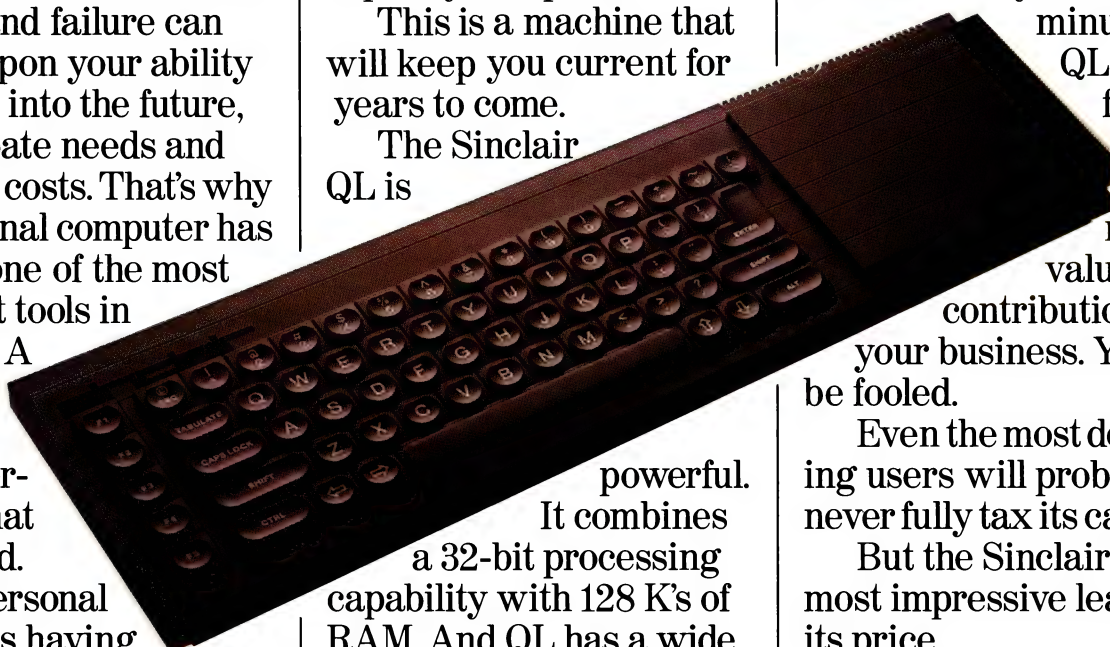
But the Sinclair QL's most impressive leap is its price.

For the first time ever, you can own a personal computer that will take you well into the future for under \$1000.

Why just take a step when you can make a quantum leap?

The Sinclair QL.

More than a step ahead.



I want to make a quantum leap! Please send more information on the Sinclair QL.

Name _____ Address _____
Postcode _____ Occupation _____ Phone _____

Sinclair QL is distributed by: TECHNOLOGY CORPORATION OF AUSTRALIA PTY. LTD.

8/303 Pacific Highway, Lindfield, NSW. 2070 Tele (02) 46 4374.

MCM2004B

ENABLE

Frank Lee concludes his evaluation of the Software Group's integrated do-it-all addition to the Lotus Garden.

IN AUGUST WE looked at the overall structure of Enable, and in particular its word processor function. This month we examine the remaining integrated functions and spreadsheet, database management system, graphics and telecommunications.

More Printer Problems

Last time I noted a problem with selecting a Qume Sprint-compatible printer for word processor output. The distributors have since advised me that the problem was in my printer — had I used a 'real' Qume, it would have worked. Well, we tried again, this time with the up-market NDK Printstar 5025 Qume-compatible. Briefly, it too fell over. I suspect the Enable printer profile has a problem, but time will tell.

Spreadsheet/Graphics

For anyone with some experience with spreadsheets, Enable is particularly easy to learn and use. There is a built-in tutorial covering the essentials of spreadsheets, another on more advanced topics, and a third showing how to create graphics from spreadsheet data.

The 'key' to this system is literally the F10 key. It throws up a 'top line' root menu from which one can perform all the necessary commands. Each command has a descriptive comment which is displayed on the second line. Arrow keys are used to move through a horizontal menu. A highlighted item is selected by pressing the Enter key; you can also select by typing the first letter of the command. (Essentially the same technique introduced with Lotus 1-2-3.)

The only problem encountered was a system hang-up when I tried to save a 40 by 250-cell spreadsheet. Although my President has 512 Kbytes of RAM and a hard disk, it quietly fell over. It may have bumped into Sidekick in the top of the RAM, but the test wasn't repeated — it's a bit scary to hear one's hard disk clunking away in an attempt to save Mbytes of data!

The Enable tutorial focuses on the promotional expenses of a fictitious tourist agency. Although I'm not a regular spreadsheet user, it took little effort to start using the system to develop my own simple example and graphs.

Graphs may be displayed on the screen or printed (if your equipment is up to graphics). I discovered that my default pro-

file was specifying a Qume Sprint 5 printer after Enable complained that my printer was unable to generate a graph. A few moments were sufficient to modify the profile for the NDK printer (at present on loan for review). This time I specified an IBM graphics printer, and the results were

excellent. Figure 1 shows one of the graphs created during the tutorial; note the variety of print fonts. A broad range of fonts and shadings is selectable from submenus.

The graph shown here is an example of a 3D side-by-side format. The columns can also be stacked vertically, and reduced to 2D format if desired. Other formats include pie-chart and line graph.

The X-axis labels were lifted directly from entries in the spreadsheet.

As with most other spreadsheets, you can also utilise 'expert' commands instead of using the menu selection process.

Enable supports a maximum of 255 rows and 255 columns, although only a portion of this spreadsheet is shown at any time. You can 'navigate' through a spreadsheet rapidly (by nominating the required



cell co-ordinates) or cell by cell (using the arrow keys). The windowing system lets you examine two separate areas of your spreadsheet using either a horizontal or vertical split-screen system. A rather nice feature is the ability to synchronise the scrolling movements of one window with the other.

The Enable spreadsheet can be saved in any of the following formats: Enable, Lotus 1-2-3, Visicalc or DIF. There is also the option of saving only the values and labels (excluding the formulae) to save disk space.

It is also possible to create a graph from data in a separate database file while still within the spreadsheet. This is just a matter of following the menu options.

The Database System

The database system is also reached from the main menu. Since the whole business of setting up a database and designing input forms is menu-driven, it was a simple matter to create and test a small indexed database. There is also a relatively primitive report language, which may be used to write macros. This language falls short of dBase II, but should prove useful in the majority of straightforward cases.

As part of the establishment of a new database, you can specify a related input form using an elegant screen design process. In essence, you use the usual word processing commands to create text on the screen, but whenever the shifted F9 key is pressed, the system creates an input field at the current cursor position, then asks appropriate questions about the field concerned. The same technique allows an input form to be updated as needed.

To an established user of more sophisticated database management systems (such as MDBS and Total), this particular system seems a bit primitive, but then it wasn't designed for sophisticated applications. It would meet the data handling demands of most users, without the need for extensive training in database principles.

You can nominate the minimum and maximum reasonable values and lengths of field items when creating a new database, and also specify error messages to be displayed in the case of invalid data being entered.

The release examined has a limit of eight indexes per database file, and a maximum of 32 fields per record.

As with the spreadsheet system, you can also create graphs from data in the data-

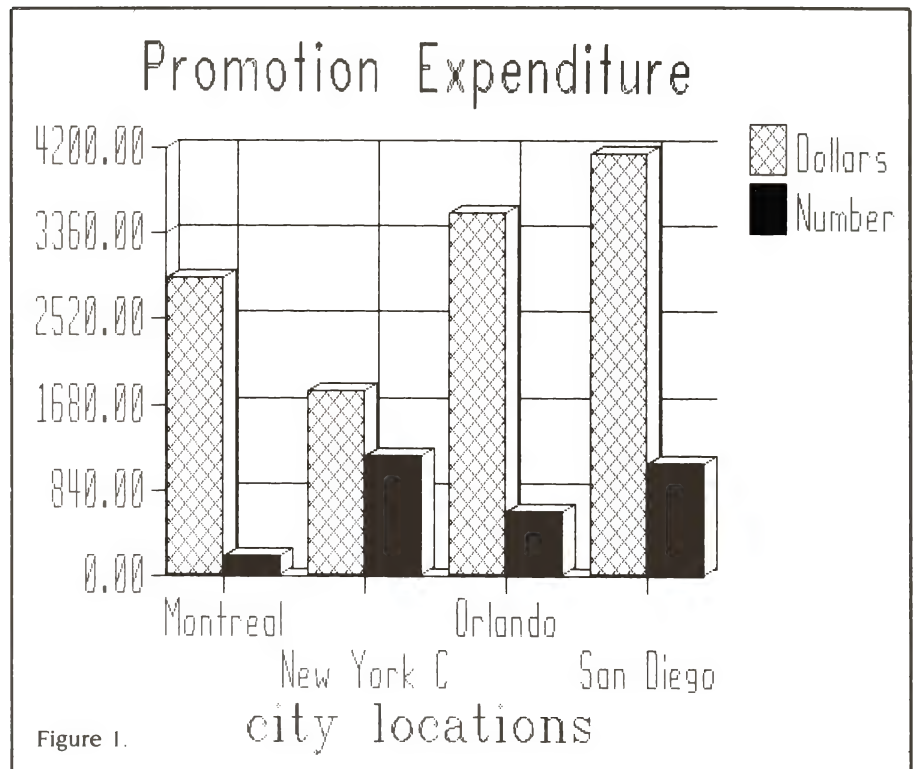


Figure 1.

base. The techniques are essentially the same in both cases.

Telecommunications

The 'Telecom' system allows you to nominate a stored 'setup' file to specify communication parameters, phone numbers, initial responses, and so on. It has a menu-driven system for modifying existing setup files or creating new ones. It allows a maximum of 64 such files. As an alternative, you can use a 'quick' setup which requires you to nominate the minimum parameters needed to make a connection. These include baud rate, number of stop bits and word size; file capture is optional. The cur-

rent time and cost of the call may also be displayed on the bottom of the screen if required. A call may be disconnected by pressing Alt End.

After starting a communication session, the top-line menu (F10 again) lets you switch to file transfer mode. According to the manual, the remote system must also be using Enable. This seemed a bit of a hassle, but reading further on I found the protocol was the good old XModem system (otherwise known as the Christensen protocol).

I still prefer Yam or Modem7, since Enable is strictly menu-driven and takes too long to start accessing a file. □

RATINGS:				
	POOR	GOOD	V. GOOD	EXCELLENT
DOCUMENTATION				
EASE OF USE				
INTEGRATION				
RELIABILITY				
VALUE FOR MONEY				

Disk incompatability? Problem solved!



Solution 1

Media Master

Media Master for the IBM PC provides access to program and data files of over forty different formats.

With Media Master you can even format a blank disk in the 'foreign' format, right on your IBM.

Formats* that can be read include:

IBM PC CP/M-86, Atrix, Avatar, Casio, Chameleon, Columbia, Cromemco, DEC VT180, Davidge, Digilog, Epson, Fujitsu, Groupil III, Heath Zenith, IDEA, ISM, Insight, Kaypro II, LNW-80, Lobo, Micral, Morrow (II, 2 and 3), NCR, NEC (PC-8001A), Olympia, Osborne, Otrona, PMC, Reynolds, Sanyo, Superbrain, Systel, TI Professional, TRS-80 CP/M, Teletex, Toshiba T100, TurboDOS, Wang Maws CP/M, Xerox 820, Zorba.

Media Master (for IBM PC) \$99.00

Media Master for the DEC Rainbow

Media Master is also available for the DEC Rainbow. It currently supports over 20 different formats.

These include:

Actrix, Cromemco, DEC VT180, Heath, IBM MS-DOS, IBM CP/M-86, Kaypro II, Lobo, LNW, Morrow MD2, NEC PC-8001, Osborne, Systel, Teletex, TI Professional, TRS80 CP/M, Xerox, Zenith.

Media Master for DEC Rainbow \$225.00

Solution 2

XENOCOPY PLUS

The ultimate production and reading machine.

If you need to read, write and format a lot of formats, including special formats not on the list, Xenocopy provides the maximum flexibility.

80 track formats require an 80 track drive to be fitted

40 track formats* include:

Actrix, Alphatronik, Ampro, Associate, ATR, Avatar, Beehive, California Computer Sys, Columbia, Cromemco CDOS, Datavue, DEC VT18X, Epson, Groupil III, HP 86a, IBM PC CP/M 86, IDEA, IESi, IMS 5000, Intersil, ISB, ISM, ITT 3030, Kaypro II, Lifeboat Assoc., LNW, Lobo, Magic, Micral, Morrow, NCR, NEC 8001, Novell, Olivetti M20, ETV, ETX, Olivetti, Olympia ETX, Osborne, Otrona, Pegasus, PMC, Reynolds, Sanyo MBC, Sharp, Siemens, Systel, Teletex, Teletext, TI Pro, Toshiba T100, TRS80 III/IV CP/M, TurboDOS, Xerox, Zenith, Zorba.

80 track formats* include:

Aitos, Ampro, AOS, ARC, ATR, Compupro, DECmate II, DEC Rainbow, DELTA, Dictaphone, Discovery, Eagle II, EPIC, Facit, KONTRON, Macsym, Micral, Micronix, Monroe, m.s.c., Nokia, Northern Telecom, OSM, Otrona, Phillips 3000, Pied Piper, Rair, Sanyo, Seiko, Siemens, Superbrain, Technicon, Teletext, Vector, Zenith

XENOCOPY Plus (for IBM PC) \$295.00

Solution 3

Apple-Turnover.

Do you need to copy files from Apple disks to IBM or IBM to Apple?

With an Apple-Turnover board in your IBM you can:

- ☐ Copy files from Apple disks to IBM disks
- ☐ Copy files from IBM disks to Apple disks
- ☐ Format a blank disk for Apple CP/M or Apple DOS

Exchange spreadsheet files between Apple programs (Viscalc and Multiplan) and IBM programs (1-2-3, Symphony, Multiplan), exchange dBase disk files or WordStar files between Apple CP/M and IBM. Transfer 'HIRES' Apple graphics files for display on your IBM. Copy Apple CP/M programs to IBM with Apple-Turnover and run them using our 80Mate CP/M Emulator.

The Apple Turnover package consists of a 'half-size' printed circuit card, auxiliary cable, software and user manual.

Apple Turnover software supports Apple DOS 3.3 (16 sector) and Apple CP/M disk formats commonly used in the Apple II, II+, IIe and IIc computers.

Apple Turnover (for IBM PC) \$545.00

Solution 4

PC-Alien

This powerful locally developed program includes many local machines, including Microbee, Portapak and Amust, as well as Bondwell, Osborne and Wangwriter.

PC Alien (for IBM PC only) \$95.00

Solution 5

Run CP/M-80 programs on your IBM-PC with no additional hardware.

80Mate software emulator allows your IBM-PC or compatible to run almost any CP/M-80 program without the expense of co-processor boards.

80Mate/80Term (for IBM PC) \$295.00

*Note: For details of the exact models from these manufacturers, please contact LOGO.

Polywindows.

This amazing new background program provides desktop productivity at a single keystroke. Even while you are running another program.

1. Your numeric keypad becomes a full feature printing calculator.
2. The Rolerdex gives you a small scale database, perfect for replacing your manual Rolodex, and it's a lot faster.
3. The Monthly Calendar, alarm clock and appointment book help you manage your time.
4. Memos, letters and lists can be instantly stored and recalled with the notepad editor.
5. Polykey lets you assign specific functions to particular keys. It rivals the high priced keyboard utilities.

Polywindows Desk (for IBM PC) \$99.50

Sidekick

The other great background utility is also available.

Sidekick (for IBM PC) \$99.95

Neglected DEC Owners

Feel neglected no longer! LOGO is an authorised DEC dealer with stacks of great DEC software. Whether you have a Rainbow, DECmate or whatever, get on our mailing list. Goodies like WPS-80 wordprocessing for the Rainbow, Media Master etc etc. are available from LOGO.

LOGO

LOGO COMPUTER CENTRE,
305 HENRY LAWSON BUSINESS
CENTRE, BIRKENHEAD POINT
PO BOX 389 DRUMMOYNE
NSW 2047

BANKCARD
VISA
*AMERICAN EXPRESS

(02) 819 6811

INSURANCE AGENTS REST ASSURED

Les Bell looks at an exciting new package which is bound to lift the spirits of many an overworked insurance agent.

THE INSURANCE BUSINESS and computerisation go together like peaches and cream. In fact, major insurance companies were among the first users of mainframe computers. Now computerisation is coming to small companies and, in particular, agencies.

Insurance agents need to keep track of their clients, using much more sophisticated capabilities than standard mailing list managers. Not only is there a need to store the client's name and address, but other information such as date of birth, sex, occupation code (risk varies with occupation), superannuation scheme details, and other general details are also required.

A new package is available which does all this and more. Called Assure, it was produced and developed by Aetna Life and Casualty's DP department, and is designed to professional standards.

More than Just a Mailing List Manager

Assure manages customer records with up to 10 mailing lists as one database, and maintains separate databases of policies, applications currently being processed,

and business prospects. It also contains a letter writer and report generator and, to top it all off, there's a general ledger package as well.

All this is quite attractive to general insurance agents, but for those who sell Aetna's policies there's an added plus — a communications utility which links the package to Aetna's mainframe system, SPEARS, allowing complete access to policy information, superannuation tables and the like.

Assure is designed to minimise the day-to-day clerical activities of an insurance agency. Usually an entry is made in the prospects database, which contains full details of a prospect — including appointment dates, date of birth, occupation code, referral source and business and home addresses. Prospect records can be added, updated and deleted.

The report writer allows reports to be produced, indicating subsets of the prospects — such as all in a particular post-code or those with appointment dates in the next week. The entire file can be listed to paper every so often for quick reference.

If all goes well and a prospect signs an application for insurance, the next step is

to transfer that person's details to the application tracking subsystem with the 'transfer prospect to client' function, which copies the data across without rekeying.

The application tracking menu works in the same way as the others, allowing the user to perform enquiries, update and delete records and list applications on the printer, as well as using the report writer to generate special reports. Special features include the ability to mark suspense codes, indicating the reason an application is presently suspended — for example 'medical exam'. Once an application is completed, its suspense code is set to CMP, and it will be transferred to the Client/Policy system.

The Client/Policy system is a small relational database which keeps track of clients and their policies. Again, the menu structure is similar to the other functions, and special reports can be generated. The client file keeps a large amount of information in each record, including two addresses, bank account and doctor details, referral source, and 10 client information and five 'other data' fields.

Once a particular client has been located in the file, the 'POL' command takes

```

===== ASSURE Client/Policy Menu ===== Version: 1
Select an item by hitting the corresponding LETTER or by hitting the SPACE bar.
When you have selected the required item, hit the RETURN key.
If you wish to leave ASSURE, then hit the ESC key.

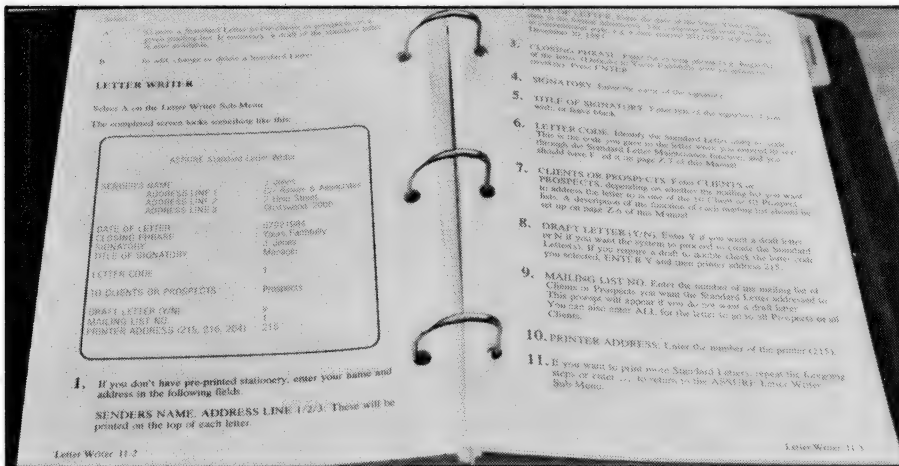
A - Client Maintenance/Enquiry
  - Alpha Maintenance/Enquiry
  - Policy Maintenance/Enquiry
  - Client Listing
  - Alpha Listing
  - Policy Listing
  - Return to Main Menu
  
```

```

===== ASSURE Policy Maintenance/Enquiry =====
ACTION:          E-ENQUIRE  A-ADD
POLICY NUMBER:  123456          E-DELETE  C-CHANGE
                                E-PRINT

1 LIFE INSD INT:  12          18 LIFE INSD SUR:  SMITH
2 DATE OF BIRTH:  01/12/1960  19 SEX (M OR F):  M
3 POLICY OWNER:   JON SMITH
4 ADDRESS LINE1:  148 DAVIDSON AVENUE
5 ADDRESS LINE2:  FORESTVILLE NSW
6 ADDRESS LINE3:
7 POLICY TYPE:    DISABILITY
8 STATUS IN/OUT:  IN
9 AGE NEXT B'DAY:  925
10 BASIC TABLE:  100
11 BENEFIT AMT:   26.00
12 RIDER PREMIUM: 26.00
13 TERM:
14 FREQ OF PAY:   MT
15 AGENT NUMBER:  0000
16 SUPER SCHEME:  THE AETNA EMPLOYEES RETIREMENT FUND
17 USER INFORM:   AND FEES 5 RIDER AT NEXT ANNIVERSARY

20 POSTCODE:      050007
21 STATE (REG):   NSW
22 RISK COMM DTC:  01/01/79
23 COMPANY:       AETNA
24 RIDERS:         1 BENEFIT
25 BASIC PREMIUM: 1.00
26 TOTAL PREMIUM: 1.00
27 FUND:
28 METHOD OF PAY:  PDB
29 SURRENDER VAL:  00
  
```



the user directly to the appropriate entry in the Policy Maintenance/Enquiry system. Policies are retrieved by sequence number; if this is not known, the system will display a summary of all policies for that client and the appropriate one can be selected.

More To Come

These three subsystems cover most of the day-to-day activities of an agency — but there is more to this package.

Another built-in bonus is a small but flexible general ledger system. While not in the same league as specialised packages, this program suite will be useful to most agencies.

The chart of accounts can be set up by the user in a completely flexible format — the only special account which must be identified is the bank account. The system supports three types of transactions: payments, receipts and journal entries.

The general ledger can produce several reports; obviously the most important of these are the trial balance, balance sheet and profit and loss statement. Other special facilities include reconciliation of un-presented cheques and departmental accounting.

The general ledger will be most useful for agencies which have several companies in their structure, want to separate several facets of the business, or do accounting for some clients. The multi-company facility is especially useful.

Slick Application

The 'SPEARS' (Sales Portable Enquiry And Response System) facility is used to access Aetna's IBM mainframe through a modem communications link. This apparently (not being an agent I was unable to try it) allows

on-line enquiries of policy status, life tables and other actuarial information. The Agent Support Program /AP50 allows on-line updating of the Aetna Alpha and policy files with no manual intervention — a particularly slick application which an Aetna agent can use to create initial data files and then update monthly.

Assure has been designed with the user in mind. Security facilities allow a single PC with Assure to be used by a number of agents, with access to different areas controlled on an individual basis. Each user can log on and off without exiting the Assure system, which is left running.

At each stage, keying three dots ('...') in response to a prompt will get the user out of that screen and back to the menu. This makes the system quick and easy to use — you can plough ahead knowing that pressing the wrong key won't inevitably lead to disaster. However, there were one or two places in the preview system where this scheme didn't work and left me with a locked-up system.

The documentation supplied with Assure is excellent — a glowing example to the Australian software industry. The manual is bound in an IBM-style slip-case, and is printed in a style which matches IBM's manuals, right down to sample screens printed in a light-green colour.

Assure is sold (or leased) by Aetna on a turnkey basis — Aetna will supply the PC, printer and software (including Multimate word processor), and will maintain it, train users, answer queries through the 008 hotline service and generally make it work. (Sometimes I wish someone had done that for me.)

Future enhancements for Assure will include a Fire and General system and a link with Multimate. Agents can either buy Assure outright (\$5000) or lease it for \$80 per month (Aetna agents can get it for \$40 per month).

All in all, Assure seems to fit the bill perfectly for insurance agents. □

PRODUCT DETAILS

Program:	Assure
Made by	Aetna Life & Casualty Limited, 2 Help Street, Chatswood 2067; (02) 411 7779.
Useful for:	Insurance Agents
Hardware req'd:	Hard Disk
Extras included:	None
Options:	None
Price:	\$40/\$80 per month on lease or \$5000 flat

RATINGS: POOR GOOD V.GOOD EXCELLENT

DOCUMENTATION

EASE OF USE

SPEED

FUNCTIONALITY

VALUE FOR MONEY

Get all your communication

Avtek Multimodem II

This is Australia's top selling modem, and with good reason. The Multimodem II is the right choice where you need total flexibility in your data communications.

Digital signal processing techniques are used to perform all major functions such as modulation, demodulation and filtering. This eliminates the need for analog filters by integrating on-board A/D and D/A converters and a digital signal processor with a 24K ROM and 1.3K RAM to perform the digital filtering. So Multimodem is more reliable, particularly on poor phone lines.

Here are just some of the reasons people choose MultiModem.

1. Fully Viatel compatibility. Multimodem provides the 1200/75 baud rate necessary for Viatel and the new generation of high speed databases. With the optional baud rate converter, Multimodem II provides 1200/75 baud rate communications for computers such as Commodore which do not support split baud rate as they stand.

2. Internal expansion buss. A Multimodem first. Most modems cannot be expanded. But as developments come along, Multimodem will be able to handle them.

3. Auto answer facility is now a true 'ring detect' circuit. Multimodem II can actually sense an incoming call and respond immediately. It is completely independent of the strength of the ring voltage.

4. Interfacing is easy. Multimodem's front and back channels are fully integrated. There is no need for special cables when using 1200/75 and other split baud rates.

5. The fully integrated baud rate converter is now available as a built in feature, reducing cost and increasing reliability.

6. Never requires adjustment. Complex modulation, demodulation and filtering are carried out by crystal locked filters. Critical analogue adjustments give way to crystal locked precision.

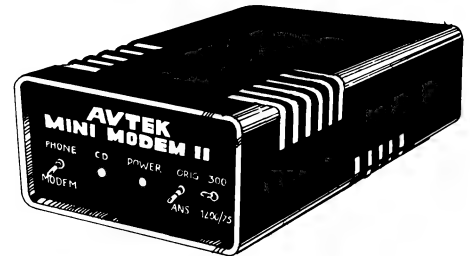
7. Digital VLSI circuitry provides Australian and US standards at the flick of a switch. CCITT and Bell standard, plus a new simplified function control allow you to select the right standard in seconds.

8. Full Analog and digital loopback facilities allow fast testing of line, computer, cabling and modem.

Multimodem II **\$365.00**

Multimodem II inc. auto answer **\$399.00**

Multimodem II inc. auto answer plus baud rate convertor **\$485.00**



Minimodem II.

New improved version of the famous Minimodem provides reliability and performance equal to Multimodem.

Additional features include:

☒ Now provides Viatel (1200/75 baud rate) and 300/300 full duplex as standard.

☒ Commodore VIC 20 and 64 version now available. These plug directly into the user port, saving users the need to buy expensive RS232 adaptors.

☒ Can be powered by the computer directly (for example MicroBee and Commodore).

☒ On 1200 baud (e.g. Viatel) special equalised position is available for improved results on poor phone lines.

Minimodem inc. power supply **\$199.00**
Minimodem (suit Commodore user port) **\$235.00**

Software for VIATEL Services

Modem communication provides the ability to do lots of things over the phone; your banking, advertising, buying, etc. but only with the right software on your computer. With our VIATEL software package you can capture Viatel pages and add the data into your own files and reports.

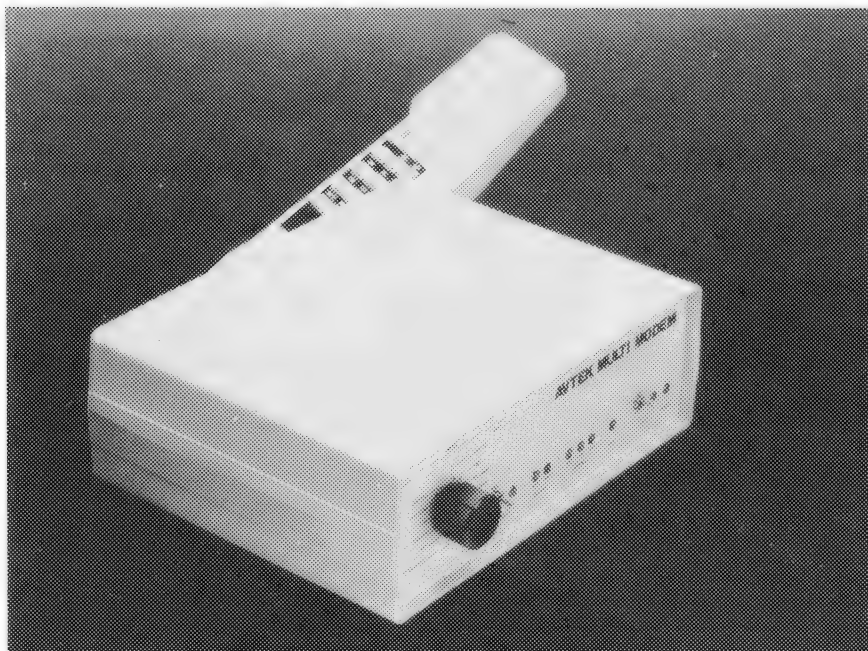
The package suits NEC APC III, IBM PC (and compatibles), Apricot, Sanyo MB550 and 555, Wang PC and TI Professional.

Here are just a few of the features.

No need for baud rate convertors

Although Viatel uses 1200/75 split baud rates not supported by most PCs, our VIATEL software will work with a standard Minimodem or Multimodem (without the baud rate convertor).

The VIATEL software handles all the baud rates changes - saving you money.



gear at warehouse prices

Saves frames to disk.

The user may ask VIATEL to save particular pages displayed on the screen or even ask VIATEL to automatically store every page that is displayed. VIATEL can then display all pages or go to a page displaying a particular keyword or phrase.

Since Viatel services charge on the basis of elapsed time, this facility can save you money.

Filter page contents.

This facility 'cleans up' pages so you can use them later with you database or word processor. VIATEL can even recall pages from one disk file while saving the filtered pages in a different file.

Features for information providers

Page editing

Use VIATEL to create pages and either save them on disk or send them to the Viatel system. The PC does not have to be connected to Viatel while making up pages - providing a considerable saving.

Create pages from PC files.

Files created by word processors and other programs can be given to VIATEL and used as the basis for Viatel pages.

For NEC APC III, IBM PC (and compatibles), Apricot, Sanyo MB550 and 555, Wang PC and TI Professional. Please specify the machine.

Normally \$275

This month only \$250.00

Contact Natwick Management for further details.

Cables

Need to fasten modem or printer to micro? We have the right leads!! At the right price.

1.8 metre male to male **\$35.00**
1.8 metre male to female (suit IBM etc) **\$35.00**

Cables are also available to suit most other non standard RS232 ports (e.g. Macintosh) ring for details **\$45.00**

Better Viatel for the MicroBee

There are Viatel modifications for the Bee, but they are hardware/software modifications and they are a compromise. The Avtek software provides the best, fastest and easiest way to put your MicroBee on Viatel. Written by Conal Walsh, famous MicroBee software developer, it provides superb, fast Viatel access on your MicroBee without the need for messy hardware modifications. Yet the price is no higher.

MicroBee Viatel **only \$49.50**
Contact Avtek directly for MicroBee software.

Acculink

Acculink is just about the most powerful asynchronous communications package you can get. It has all the facilities to allow the APC-III to communicate directly or via modem with virtually any other computer.

Both error checking file transfer and conversation modes are provided. A separate configuration program is provided to allow the user to configure the software to a variety of communications needs.

Menus guide the user through all sequences needed to establish communications.

'No doubt. This is the best comms package I've ever used.'

Barry Polinsky

Acculink communications software
normally \$285.00 **\$250.00**

NEC Printers

When it comes to printing it out, NEC Pinwriters have no competitors!! Send for details about the staggering new NEC P5 with letter quality at 94 cps. And at these prices they won't last long!! Specials for this month only.

P2 Pinwriter **\$1095.00 \$995.00**
P3 Pinwriter **\$1410.00 \$1350.00**
P5 Pinwriter **\$1995.00 \$1895.00**

All cables and printer switching equipment available at very competitive prices.



NEC APCIII

The fastest and lowest priced PC on the market. With the NEC the world is your oyster! Serial and parallel ports are standard. The superb resolution of the NEC, in both colour and monochrome makes it the only choice for Viatel. And all the best software runs on the APC. At the lowest prices.

To top it all off, for this month only, we are offering knockout prices on the most popular systems.

Get in early to avoid disappointment!

SYS1M 1 x 720K disk drive	\$2995.00
	\$2875.00
SYS2M 2 X 720K disk drives	\$3565.00
	3445.00
SYS3M 1 X 720K drive plus 10MB hard disk	\$5195.00
	\$4995.00

Including Colour Monitor

SYS1C 1 x 720K disk drive	\$3995.00
	\$3550.00
SYS2C 2 X 720K disk drives	\$5595.00
	\$4095.00
SYS3C 1 X 720K drive plus 10MB hard disk	\$6155.00
	\$5665.00

Avtek (Electronics) Pty Ltd

Phone (02) 427 6688
PO Box 651 Lane Cove NSW 2066

Note: Competitive dealer discounts apply.

Natwick Management

Phone (02) 428 1666
Suite 2/25 Burns Bay Road
Lane Cove 2066

APC III
ADVANCED PERSONAL COMPUTER III

INTRODUCING IBM Compatible Hi-Res Monitors from **QUBIE**

The HR 39 and HR 134 Monochrome Monitors are direct replacements for the IBM Model 5151 Monochrome Display. The HR 39 features a GREEN phosphor screen, while the HR 134 an AMBER screen. Both monitors plug into the IBM Monochrome Display and Printer Adaptor (or compatible) card.

The HR31 200 Colour Monitor is a direct replacement for the IBM Colour Display. It plugs into the IBM Colour/Graphics Adaptor (or compatible) card. The HR31 200 features **0.31mm dot pitch and a black matrix picture tube**. This special tube reduces glare and enhances RGB colour to ensure superb picture quality.

All three monitors include a tilt and swivel base. Use your Qubie' monitor as you would the IBM ; it will in no way affect the normal use or function of your Personal Computer.

Technical Data - HR31 200

CRT Size:	14" Diagonal (34cm)
Tube:	Black Matrix
Sync-H. Scan Frequency:	15.7kHz
V. Scan Frequency:	60Hz
Signal Type:	RGB I: TTL Level Positive Sync H/V: TTL Level Positive
Display Size (H x V):	245mm x 170mm
Retrace Time (H x V):	0.5Ms x 0.4msec
Resolution:	640 x 200 lines
Input Terminals:	9 pin "D" type connector
Dimensions:	11"(H) x 15"(W) x 13"(D) 266(H) x 367(W) x 318(D)mm
Shipping Weight:	15.9kg



Model HR31 200

Technical Data - HR 39 & HR 134

CRT Size:	12" Diagonal (29cm)
Phosphor:	HR 39 (Green); HR 134 (Amber)
Sync-H. Scan Frequency:	18.432kHz
V. Scan Frequency:	50/60Hz
Signal Input:	Video - TTL Level Positive Sync H - TTL Level Positive Sync V - TTL Level Negative
Video Response:	20MHz
Display Size (H x V):	203mm x 135mm
Display Time (H x V):	44Ms x 18.99msec
Resolution:	Centre 1,000 lines Corner 800 lines
Display Formats:	9 x 14 matrix, 2000 characters in 80 x 25 format
Input Terminals:	9 pin "D" type connector
Dimensions:	10.5"(H) x 15"(W) x 12"(D) 257(H) x 367(W) x 294(D)mm
Shipping Weight:	11.36kg

All models: 240V AC/50Hz



Models HR 39 & HR 134

(All models Right-hand controls only.)

DEALER ENQUIRIES:

QUBIE

9/62 Blackshaw Avenue, Mortdale, 2223 - Phone: (02) 579 3322

**America's leading distributor of IBM PC accessories is
now supplying your IBM dealer locally. . .**

Also available: IBM key boards, multifunction memory boards and modems.

IBM is a registered trademark of the International Business Machines Corporation

John Sands SEGA... Superior in Videotex



and a first class computer as well!

"Considered the most powerful and versatile computer/terminal in its price range, not only in Australia but in the world. The SEGA system offers you all the Videotex features and a full computer facility for about the same low cost as a dedicated terminal."

Communicating

Features include:

- Terminal modes: Prestel (Viatel) Standard ASCII Teletel
- Editor transmission modes: I.V.S. 3 Prestel Forms
- Two printout modes: Dot matrix and Daisy wheel
- 26 page memory - save to disk or cassette for later use
- Full help menu
- Carousel viewing function
- Modem: 1200/75 switchable to 300 Baud rates
- Cartridge or disk software formats

Computing

Features include:

- 16 colours, 32 sprites, 5 octave sound range
- Full typewriter style keyboard
- 48K RAM or 80K total RAM with Super Control Station, fully upgradeable with an extensive range of peripherals
- Powerful spreadsheet and database
- Powerful word processor
- Full implementation of Logo
- Small business packages
- Large range of educational software and games

For full details on the Superior Videotex/Computer Package

Send to: **John Sands Electronics,**
6 Bay St., Port Melbourne 3207.
Tel: (03) 645 3333

Name

Address

..... Postcode

John Sands

SEGA®

SPEEDIT

MORE THAN A PROGRAM ITS AN EDUCATION

- Simplifies Basic Programming
- Creates bug-free Programs
- Cuts Development Time
- Improves Programming Productivity

Create Basic Programs on your IBM PC or compatible, quickly, simply and efficiently. **Speedit** eliminates the use of line numbers, Gotos, and the obscurities of traditional Basic programming.

Structured flowcharts translate directly into Basic.

So if you're writing a program in Basic, **Speedit** to perfection. Minimum requirements — IBM PC or clone, 192k RAM, DOS

MICROSHARE SYSTEMS PTY LTD

P.O. Box 88, LEURA, NSW 2780

Telephone: (047) 588 005

Please rush me: **SPEEDIT** system ☐ \$79.95

☐ Demonstration Version \$19.95

(Prices include Tax)

Name

Address

..... Postcode

My Cheque/Money Order for \$. is enclosed.

Limited stocks at this price. Special concession for schools, universities and technical colleges.

YC 10/85

BIT BUCKET

BIT BUCKET

SYMPHONY SPELLING CHECKER

Distributor: Imagineering 579 Harris Street Ultimo 2007, (02) 212 1411

Price: \$233

These days, anyone producing a word processor must also provide a spelling checker, so Lotus has released a spelling checker for use with its integrated package, Symphony.

The Basics

All spelling checkers attempt to identify misspelled words and allow you to correct them, and some even offer suggestions on the correct spelling. However, most programs list words for the spelling check in alphabetical order, so they can't offer any suggestions if you get the first letter of a word 'rong'. Symphony's checker gets round this hitch by using a phonetic check.

What You Get

Symphony comes in a plastic case and the spelling checker comes in a scaled-down version containing the disks, a manual and a quick-reference card. The installation is spelled out (sorry) in voluminous detail: it takes 28 steps on a hard disk! You need a CONFIG.SYS file and, although the installation guide tells you what to do if you already have such a file, it doesn't mention what the Symphony CONFIG.SYS file contains. On a two-disk system you're told to add the speller program, which occupies about 130 Kbytes, to Symphony's help and tutorial disks.

There are three Spelling Checker disks: a program disk and both an American and a British dictionary. The American dictionary puts 80,000 words into 217 Kbytes, while the British version fits 99,000 words into 255 Kbytes. The American dictionary accepts both 'catalog' and 'catalogue', but rejects 'colour'; and the British version accepts 'generalise' and 'generalize', but not 'color'. The manual has this to say on the subject:

"Some words have two spellings. Spelling checker accepts both spellings of a word as long as neither spelling is distinctly preferred. If a word has a preferred spelling and its second spelling is generally considered to be rare, spelling checker highlights the rare spelling as a spelling error."

This seems a good arrangement (once you've deciphered just what it means), and Lotus is to be congratulated for providing this choice of dictionaries. An on-line help facility is also provided, taking up about 10 Kbytes.

Options

Symphony's spelling checker offers an unusual number of options which can be toggled on or off. One of these, also found in other programs, is to correct repeated misspellings. Less common are a check that the first word of a sentence is capitalised and one to check whether hyphenated words are to be treated as a unit (mother-in-law) or as separate words (one-year-old-babies). Another check highlights words which appear twice in a row and provides the option of deleting the second occurrence.

When you want to add a word you have up to six auxiliary dictionaries to choose from, but Lotus gives no indication of any limits to their size. Unfortunately, the dictionaries are stored in non-ASCII files, so in order to see which words are in them you have to copy them to a print file (.PRN) first.

Using Spelling Checker

Because this program has so many options it can be a little tricky to operate. I had some problems with the installation, but once I started running the checker everything went smoothly. The main correction menu offers the choices List, Edit, Resume, 1, 2, 3, 4, 5, 6 and Quit. 'List' gives you a list of suggested words, 'Edit' enables you to type in corrections, 'Resume' ignores the misspelling and goes to the next word, '1' to '6' add words to one of the numbered dictionaries, and you can work out what 'Quit' is for.

The repeated words menu has the choices 'Erase', 'Resume' and 'Quit', and the capitalise menu allows you to 'Capitalise', 'Resume' and 'Quit'. If you add a word which is capitalised in your document to one of the dictionaries you are asked whether you want the word to be capitalised in the dictionary.

The spelling checker is rather slow, as are most of its competitors, especially when you're waiting for it to come up with a suggestion. However, it did have a high success rate when I threw deliberate misspellings at it.

At \$233 the Symphony spelling checker is not cheap, especially as an add-in to an already expensive program, but it is a capable product. If you use Symphony for word processing and if you can afford it, this program is highly recommended. □

BY JOHN NICHOLLS

TANDY 200

Manufacturer: Tandy Australia 91 Kurrajong Avenue, Mt Druitt 2770, (02) 675 1222

Price: \$1399

Two years ago Kyocera stunned the world with the first really portable, battery-powered computers with 40-character by 8-line liquid crystal displays: the Tandy Model 100, the NEC PC8201 and the Olivetti M10.

The Tandy 100 was followed by the Model 200, which has a hinged 16-line screen, standard parallel and serial ports, a bar code reader socket and a built-in modem. A healthy assortment of software is included in ROM: there's a BASIC interpreter which is compatible with the Model 100 BASIC, a Multiplan spreadsheet, Telcom communications and a Text word processor. □

Memory

Forty Kbytes of RAM is used, and two more 24 Kbyte banks can be added to take total RAM to 72 Kbytes (the standard has been 24 Kbytes of RAM). This RAM is battery-backed and holds its contents even when the main power supply is disconnected. It's arranged as a RAM drive and can hold up to 46 user files. As each file is added, space for processing is reduced, but mass storage on cassette or on disk through the optional disk drive/video interface is possible.

ROM Software

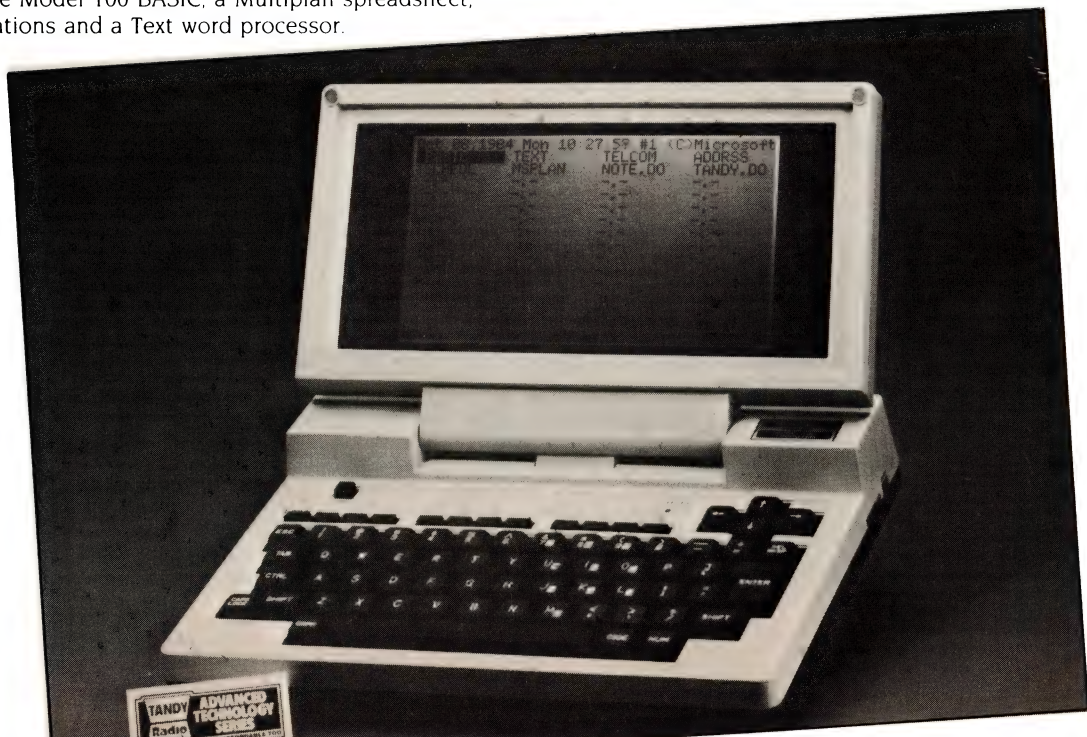
Text, the Tandy 200's word processor, has all the usual cut-and-paste, search, delete and block-move functions. Output is divided into lines and pages, and margins are set. Headers, footers, page numbering and right-justification of text are not supported. Printing is blindingly fast: my test indicated about 500 characters per second.

The Tandy 200 also has Microsoft Multiplan in ROM and supports up to 63 columns and 99 rows, although the amount of available free memory, the formulae and the data inserted all combine to limit the number of usable cells. I created a spreadsheet with a fairly complicated formula in each cell and was limited to 91 rows and 10 columns. At one-fifth the speed of Lotus, Multiplan is no speed demon, but, given the spreadsheet size, it's adequate.

The Tandy 200's database allows you to search for key phrases in strings in any ASCII file and list them either on the screen or to the printer. There are two other programs on the opening program, ADDRSS and SCHEDL, which use the same routines to look at ASCII address book and schedule files. ADDRSS can also auto-dial the modem, while SCHEDL can set alarms at times specified within the file.

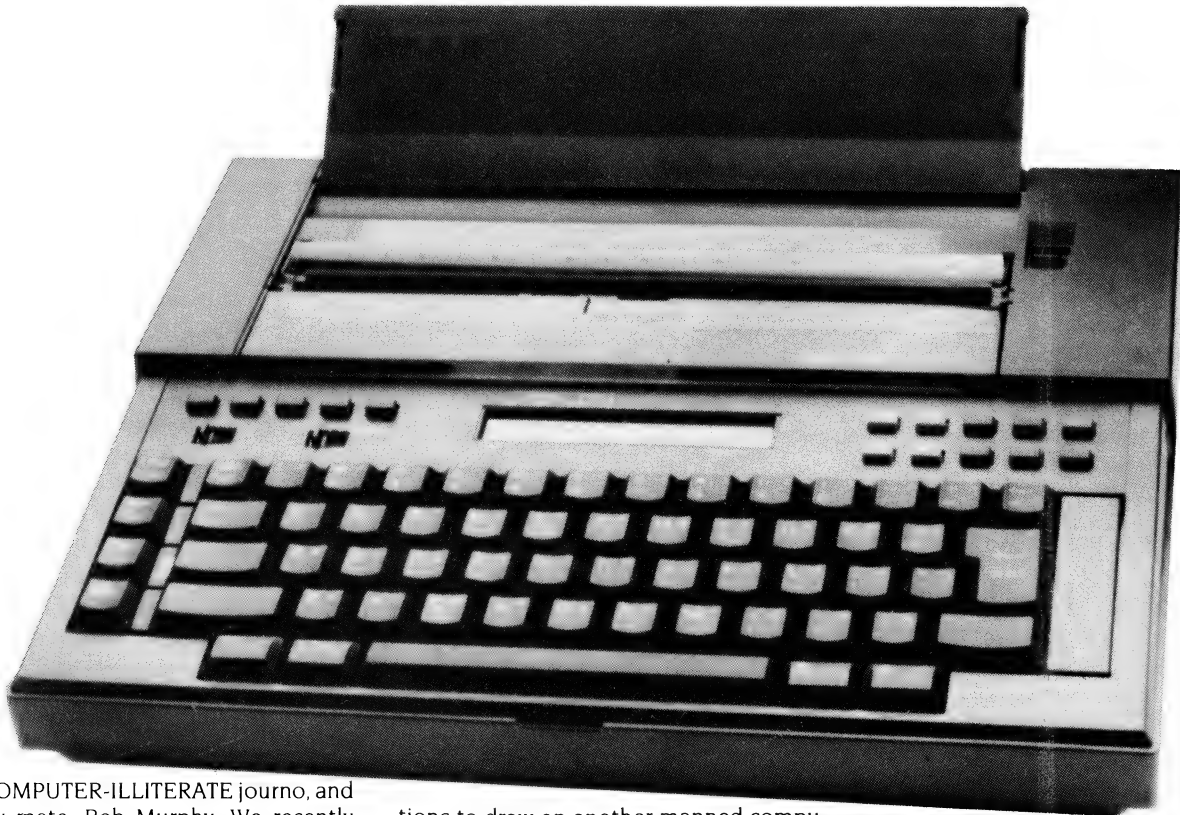
This review was written on a Tandy 200 and uploaded using Telcom, the communications program, to an MS-DOS disk on another machine for transfer to *Your Computer's* typesetter. I've also used Telcom to access bulletin boards. Apart from the slow saving and loading of files and the memory limits, the Tandy 200 is a versatile and competent machine. □

BY JOHN HEPWORTH



OH BROTHER!

*God's own gift to travelling journos and business people,
or wolf in sheep's clothing? Ted Doyle puts the
Brother WP600 to the test.*



I'M A COMPUTER-ILLITERATE journo, and so's my mate, Bob Murphy. We recently decided to 'get with the pace' of the twentieth century by trading in our battered Olivetti manual typewriters for a couple of electronic jobs. That led to the purchase of two Brother WP600s. This latest midget word processor proved, however, to have a couple of features which made it into a wolf in sheep's clothing ...

Firing up the Brother terminal with one of the six mode settings and connecting it to a modem or coupler allows instant file transfer to a distant computer. (Knowing that the ways of marketing men are indeed strange, we didn't ask the Brother people why they had designated what is, essentially, a peripheral terminal as a word processor.)

Besides being a word processor, the WP 600 is capable of sufficient communica-

tions to draw on another manned computer's files, and to file to it — God's own gift to travelling journalists and business people.

So, for \$900 you don't get a computer, but you do get a fairly powerful word processor and a very powerful information transfer device.

Somebody at Brother obviously got the message that data processing is about 'output, output, output'; the WP600 comes complete with a dot matrix printer capable of printing in ribbon or thermal modes.

The entire package is small — 27 cm deep, 34 cm wide and 6 cm thick — and fits nicely into an optional, soft, leather-like carrying case.

Limitations

We found a few limitations with the pro-

cessor side of it, and the small liquid crystal display (24-digit) makes editing, or even remembering what you just wrote, difficult. We got the best results by using the processor in the 'justify' mode (where for some reason it prints every line as you hit return), and then using the finished printout to find and correct boo-boos in the file — that's still painfully slow.

The people at Brother aren't saying, but it would seem the need to get the machine on the market led them to use the old EP 44 case and LCD hardware, arranged round a bunch of new chips — there's no other excuse for not going with a completely revamped case design with a nice swing-up keyboard lid and a three-paragraph LCD inside it.

There are also some program limita-

tions which result in 'hard' return symbols locked to an empty line. This requires an Alt/delete and question/answer routine to get rid of the pesky carriage return, and I found it altogether a pain in the neck.

Those bitches aside, it sure is a relief to hit the morning plane, assemble the Brother, do some editing, and print a whole bunch of stuff you were supposed to have finished last night.

The disk drive uses a 9 cm microfloppy disk *a la* the Apple IIc, which increases the basic storage package to 114 Kbytes, with the WP600 memory alone storing 14.5 Kbytes and the disk capable of 100 Kbytes. That gives about 10 pages of text in the processor memory and something like 40 pages on the disk.

The filing arrangement is in blocks, with 80 blocks of roughly 1250 Kbytes each on the disk. The blocks, however, appear to be contiguous and it's okay to fill the disk with a single file.

Moving into Comms

By the time we'd had the Brother for a month, we were coping with the LCD and random CR hassles, and we had no trouble getting good use out of the machine.

About then, we decided to investigate the comms side of things; in particular, transferring data to an IBM PC. The last time this writer looked inside anything electronic it was an army multi-channel telegraphy unit with valves; a piece of something hot and hard flung by an angry Vietnamese had come hurtling through the back of it, leaving a roughly circular

Somebody at Brother obviously got the message that data processing is about 'output, output, output'; the WP600 comes complete with a dot matrix printer capable of printing in ribbon or thermal modes.

hole and doing things to the gizzards that Mr Plessey's field service manual never foresaw. We didn't know if the object was a piece of shrapnel or an unexploded 40 mm shell, so the unit came apart gingerly.

Filled with a similar terror, we took the IBM PC apart to install the absurdly expensive comms board (\$150 is dear — I don't care what anyone says), and then we came upon the mysteries of RS232. After several attempts to build a cable that worked we discovered the IQ Technologies Smart Cable and things got better.

On that very day the Smart Cable dragged us, filled with wonder, into the latter quarter of the twentieth century, and some kind soul gave us a 'PC Talk' disk from Freeware, an American organisation dedicated to user support. Having only experi-

enced the tiger sharks who pose as computer salesman and having resigned ourselves to the 'You need this little jigger here to enable that function — it's only \$900' approach, user support software is a concept we grasped quickly — one cheque for \$US35 is winging its way east now.

What wonders! We'd managed to get the little WP600 running the IBM like a charm. The user-supported software was well produced and documented, and also powerful beyond our fledgling ability to exploit it — and all for \$35! Here our complete ignorance of anything more sophisticated than a field radio had us lost in software. Initially we couldn't get it to strip the Wordstar format and print commands, so the file wouldn't go to memory on the WP600 and instead printed a hard copy (albeit with strange spacing and word wrap).

Then we discovered how to print the files to disk in the 'PC-Talk' subdirectory, which meant they could be transmitted to a file on the Brother without the printer being involved. The final printout was still weird, but a rough copy of a file was really all we needed.

The unit does the latter well, and as 'PC-Talk' writes straight to disk, the Wordstar found itself filled with unformatted files from the WP600 in no time. It was then only a matter of inserting Wordstar carriage returns on the PC to print a copy.

What You Pay and What You Get

The total bill for the WP600 — disk drive, thermal paper roll carrier, disks and all — ►

Australia's Top
Motorcycle Monthly

TwoWheels
ON SALE AT YOUR NEWSAGENT EVERY MONTH

was more than \$1000, which is pretty smart pricing for a fairly flexible terminal unit with all the goodies.

If there were a second RS232 port and some device for writing to disk on incoming transmissions, the little thing would be formidable.

Good Things, Bad Things

Good points about the Brother? Price, of course. The ergonomics of the keyboard are also fine, with one exception (see later). It's a soft-touch board with beautifully shaped keys which fall to the finger very naturally. Key action is clear and precise, with no hard stop at the bottom of the stroke.

All functions are perfectly clear, and an extra control key, marked 'code', along with a second shift key, expands the board from 44 characters and 20 functions to 88 and 20 respectively.

The printer has auto insert and remove for paper, and the typeface is large, clear and damn near daisywheel-quality. There's a roll dispenser which clips onto the machine for handling continuous paper, while the plastic column ruler over the platen pushes back to act as a cutter.

All function keys are clearly marked and perform perfectly. The machine runs on four D cells and has an auto-off function. There is also a plug for an external six-volt source.

The bad things? The pesky LCD and random CRs we've already discussed, and finally a complaint about the otherwise superb keyboard. It has an upper-case lock

Those bitches aside, it sure is a relief to hit the morning plane, assemble the Brother, do some editing, and print a whole bunch of stuff you were supposed to have finished last night.

which you tend to hit when reaching for the 'A' key, and it always seems to take a sentence or two before you realise a red 'idiot light' built into the key is on.

Print speed is decidedly slow at 16 characters per second, but the printer is reliable and can be left to churn through the roll while you do other things.

Perhaps the most serious complaint is the inability of the printer to type properly on normal paper. It requires a gloss-finish thermal paper, even for ribbon work, and gives a decidedly furry finish on normal stuff. That makes multi-colour letterheads a bit of a worry, though we found we could print on Brother's slightly shiny stuff and then whack that in the photocopier with a tray loaded with letterhead paper — the results were ace.

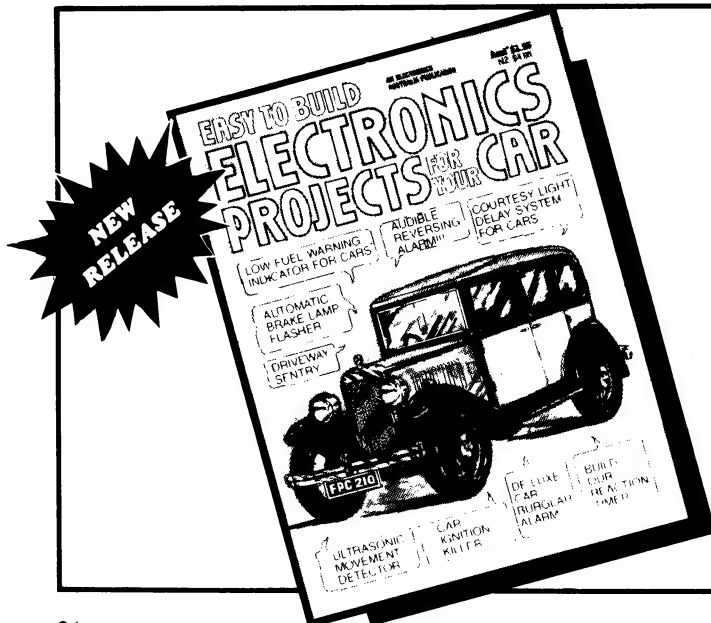
Final Thoughts

In summary, the WP600 is probably a harbinger of things to come, and Brother could possibly have a bigger LCD, multi-paper-type printer and plug-in software for the next version, which is about 18 months down the track.

The two machines we used have been subject to every abuse we could dish out and haven't missed a beat. Murphy, who is American and operates in the overkill zone, even typed a continuous file which nearly filled the disk and printed it out in one sitting without melting the printer head. The thing is strong, bouncing it off the pavement and letting it rattle around the sleeper cab of an interstate truck didn't faze it — we tried.

The only abuse which did cause a problem was Murph carrying one of the micro-floppies in his pocket — along with the crumbs, dust, nuts and washers any growing boy gathers along the way. Result? Bad craziness in the I/O department. It's okay, though; he blew it out with a compressor and the poor thing worked just like a new one — wouldn't you, for fear he'd do the same, or worse, again?

The biggest bitch of all is the documents, which are better than your average Japanese handbooks, but still leave a disturbing amount to the imagination. Readers should remember, however, they were in the hands of a couple of fellers who, until recently, were convinced that DOS meant finding a place to sleep ... still, isn't that most customers? □



With these selected projects from **Electronics Australia** you can add all of the gadgets and gizmos you've dreamed of —

Cruise Control
Courtesy Light Delay
Deluxe Burglar Alarm
Headlight Reminder
Audible Reversing Alarm
Transistor-assisted Ignition with Optoelectronic Trigger
 . . . and many more easy-to-build projects to add value, interest and safety to your pride and joy!

Available from your Newsagent Now! Or send \$3.95 plus \$1.00 post and packing to **Electronics Australia**, PO Box 227, Waterloo 2017, NSW.

Business

Chemists Keep Up With the Times 98

Chemists are prime targets for computerisation — not only do they have the normal management requirements of any small business, but they also need up-to-date and accurate information on available drugs and patients' records. Commercial systems are now available to meet most of their needs. What everyone's still waiting for is the software to convert doctors' handwriting into something remotely legible.

Viatel Grapevine 102

Wanna win a bundle? Money Watch is a dangerously attractive service destined to seduce all those who have yearned for the excitement of the Stock Exchange floor. No need for legalised casinos when you can access telebroking from the privacy of your own home. Our Viatel voyeur, Norman Kemp, checks out this service and some new equipment in this month's roundup of the world of videotex.





CHEMISTS KEEP UP WITH THE TIMES

*Norman Kemp takes a
look at computerised
prescription processing and
how it can help
pharmacists reduce drug
risks.*

from the Editors of Consumer Guide . . .

EASY-TO-UNDERSTAND GUIDE TO HOME COMPUTERS

Confused by all these computer terms? This clearly written book from the editors of *Consumer Guide* tells exactly what computers are, how they work and why they are so amazingly useful, all in plain English. Here is all of the information needed to understand and use computers, and even to start programming. A special buying section compares the most popular home computers. This book is your ticket to the computer age! Spiral bound, 96pp.

H0066G

\$8.50

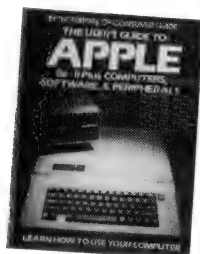


THE BEST VIC/COMMODORE SOFTWARE

Trying to find the most suitable software for personal computers can be frustrating. The editors of *Consumer Guide* have compiled comprehensive reviews of VIC 20 and Commodore 64 programs based on ratings by user groups; further evaluation is given by the editors and Commodore software experts Jim and Ellen Strasma. Each review describes the program's purpose and features, detailing both the good points and bad. Each program has been rated for ease of use, clarity of written and on-screen instructions, and overall performance. The program's price, publisher, format and hardware requirements are also included. The reviews are presented in sets by topic: Word Processing, Business, Home, Education, Networking, Strategy Games, Arcade Games and Programming Aids. Spiral bound, 192pp.

K0052G

\$8.50



THE USER'S GUIDE TO APPLE

The editors of *Consumer Guide* have compiled a thorough introduction to the Apple IIe and II Plus computers, software and peripherals. With colour illustrations and a clearly written text, this reference will guide the newcomer through all phases of learning how to use the computer: From setting the system up, learning what each key does, expanding the system with peripherals, to buying new software. Specific exercises are included for each of the keys. Spiral bound, 80pp.

H0061G

\$8.50

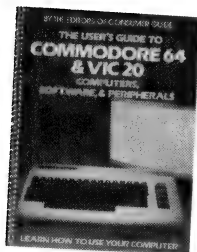


THE BEST APPLE SOFTWARE

Trying to find the most suitable software for personal computers can be frustrating. The editors of *Consumer Guide* have compiled comprehensive reviews of Apple II, II Plus and IIe programs based on ratings by user groups; further evaluation is given by the editors and Apple software expert Roe Adams. Each review describes the program's purpose and features, detailing both the good points and bad. Each program has been rated for ease of use, clarity of written and on-screen instructions, and overall performance. The program's price, publisher, format and hardware requirements are also included. The reviews are presented in sets by topic: Word Processing, Business, Home, Education, Networking, Strategy Games, Arcade Games and Programming Aids. Spiral bound, 160pp.

K0060G

\$8.50



THE USER'S GUIDE TO COMMODORE 64 & VIC 20

The editors of *Consumer Guide* have compiled a thorough introduction to the Commodore 64 and Vic 20 computers, software and peripherals. With colour illustrations and a clearly written text, this reference will guide the newcomer through all phases of learning how to use the computer: From setting the system up, learning what each key does, expanding the system with peripherals, to buying new software. Specific exercises are included for each of the keys. Spiral bound, 80pp.

H0065G

\$8.50

**Order today from Federal Marketing Book Sales —
Simply return the Freepost reply card!**

Postage and packing additional.
Please refer to the reply card.

AMONG THE MOST critical users of micro-computer systems are members of the medical profession and associated services. Their needs are demanding — precise records are essential for the treatment of patients, and the standard of programming has to be extremely high.

In recent years micros have advanced into the consulting rooms and surgeries of doctors and dentists to keep individual and family records, and are now progressing into the dispensaries of pharmacists for computerised prescription processing.

Although several commercial companies have ventured into the pharmaceutical field, few have succeeded in satisfactorily meeting the requirements, which range from handling powerful and sometimes potentially dangerous drugs to providing instant access to patients' records, stock control and keeping track of information issued by drug suppliers.

According to John Johnston, marketing director of Foundation Medical systems of Artamon, Sydney, the secret to successful pharmaceutical computing is software. Vendors, he said, have tried to sell pharmacists various brands of hardware without the particular software required for the highly specialised processes.

"Selling pharmacists technological equipment rather than appropriate software is not particularly productive," said Johnston. "The pharmacist is interested particularly in how suitable the equipment will be for his or her business, and the ways in which it can assist productivity. In fact, existing technology has capabilities far in excess of the work a pharmacy requires, so technical considerations are secondary."

2000 Potential Sales

Foundation Medical Systems is a leading supplier in this field, with experience in supplying medical and pharmaceutical computer services dating back six years. Managing Director John Clarke gained his pharmaceutical experience with the Roche drug company, while John Johnston was formerly with another multi-national drug house, Abbot Laboratories. The company's Training Director, Nancy Maher, has worked in dispensaries for 15 years. Its two major competitors are Spauldings of South Australia and Australian Pharmaceutical Industries — many others which started in recent years have withdrawn. About 1200 pharmacies around Australia have computers, and according to Johnston there are around another 2000 potential sales.

About 1200 pharmacies around Australia have computers, and according to Johnston there are around 2000 potential sales.

In its early pioneering days, the company sold Polaris computers in Victoria. Although the American-made Polaris is now defunct, a few models are still working in pharmacies, according to Johnston. They were reasonably ahead of their time with a Z80 processor, 64 Kbyte memory and two floppy disks of 256 Kbyte capacity; and with two printers they sold for \$26,000. FMS upgraded a couple of years later to the Zeda, the first computer available in Australia with an integrated hard disk of 5 Mbytes capacity, which has since faded from the scene. "They were very reliable, but the problem was that they were single-user machines that could not be expanded," Johnston said. About 90 were sold, and several are still being supported, although the line has been discontinued.

The principal systems sold are the Televideo single- and multi-user models, which were introduced about three years ago. According to Johnston, the Televideo range currently dominates the market, with installations at about 160 sites. Reflecting the trend towards lower prices for hardware in recent years, a Televideo configuration comprising two terminals with 360 Kbyte disks and three printers can be obtained from about \$16,000.

Over the past six months, FMS has also been selling the MS-DOS 256 Kbyte NEC APC III with monochrome screen, 10 Mbyte hard disk and two printers for around \$9200. The high-resolution colour screen available for the NEC APC III is a major feature for a number of pharmacies, Johnston added. "The colour version highlights various aspects of pharmacy processing such as drug interactions." This allows the pharmacist to tell by the shades and colours not only whether a new drug could interfere with a patient's existing prescription, but also indicates the severity of the problem. It's just one of the many ways in which software programming can be tailored to assist the pharmacist to detect a

problem, and is also of vital concern to the patient who may be some distance from the regular doctor and unable to get exactly the same medication. The computer can also give guidance on whether the prescription has been made up in the correct proportions and check the dosage.

To ensure that its software meets individual requirements, FMS writes its own programs in a structured BASIC for CP/M operating systems, which it calls FS (Foundation Systems) BASIC. The company has a proprietary multi-user operating system, FS-DOS, which supports up to 16 users, and also has MS-DOS programs for single-user sites. "When we entered the pharmacy market CP/M was the only major operating system, with several others of lesser note," Johnston said. "None had the kind of capabilities for executing jobs in dispensing or pharmacy. A principal requirement was very fast retrieval of information from large databases, and CP/M could only address files up to 4 Mbytes. Now there is no problem getting 16-bit operating systems that can support 10 and 20 Mbytes and the multi-user peripherals which most pharmacies need."

The company's FS-DOS is similar to TurboDOS explained Johnston. It had a curious history, having been written originally in New Zealand in 1978 by some American programmers working on medical systems with Foundation Computers. FMS, which is not connected with Foundation Computers of New Zealand, subsequently licensed the operating system for its own equipment, and still gets regular enhancements. An example of its capability when more than two jobs are being carried out at one time is that while an order is being prepared by one operator, different dispensary tasks can be carried out at another terminal.

"Our expertise is in being a computer company which became involved in the writing of an operating system, as well as applications software and other packages for hospitals and pharmacies," said Johnston. "We now have a number of products in the medical field which we are continually extending."

Saves Chores

According to Johnston, pharmacists have to do a lot of clerical work to get prescriptions paid by the government when dispensing for the public. Typical chores include writing repeat forms on official stationery, writing drug labels for bottles and packets, coding information for later refer-

ence and maintaining patients' records. They may connect directly to and acquire the latest details from the National Drug Information Service and then print notes about 'new wave' products such as reactions on people with allergies or sensitivities to certain organic chemicals.

It is usual for a pharmacy to have at least two printers — one dedicated solely to printing labels off rolls, and another used for various forms of reference. A third printer could handle the business aspects of the pharmacy, such as word processing and accounts. Most pharmacies purchase a minimum of two terminals so one can be used exclusively in the dispensary and the other for general office purposes. In very busy pharmacies, the equipment can operate for most of the day.

FMS has entered into a joint marketing arrangement with the Victorian and Queensland branches of the Pharmacy Guild of Australia. Johnston claims the Pharmacy Guild co-operation isn't an endorsement, but a joint venture in sharing expenditure on research and develop-

ment, preserving pharmacists' investments in specialised software and in training. More than 90 per cent of pharmacists belong to the Guild.

One of the most experienced users of an FMS system is Bill Abbotsmith of Ipswich in Queensland, who has a single-user Tele-video system which connects not only with the National Drug Information Centre in Canberra, but also with the Dialog Information Retrieval Service at Palo Alto, California. From his pharmacy computer he's able to search for and supply answers to medical and pharmaceutical problems from the hundreds of thousands of records maintained by Dialog on a daily basis. "This means I can readily obtain up-to-date, 24-hour information including drug profiles, interactions between certain drugs and any other aspects relating to pharmacology," he said.

"Since installing the system, my pharmacy is operating in a far more professional and efficient manner. In addition to script processing, I am also reaping the benefits of having financial management

information, marketing reports, stock control and instant access to patients' records. Patients appreciate the short waiting time and the comprehensive instructions which accompany the scripts. When a prescription is presented, three printers work simultaneously at labelling, filling repeat authorisation forms and compiling a drug profile."

The joint venture between FMS and the Victorian Pharmacy Guild has resulted in a rapid growth of computers in the state. Johnston said the Victorian venture was based on the installation of 100 Foundation systems in the first 12 months. "However, the Foundation and the Guild have achieved this target well within the one-year period, vastly exceeding all expectations." "Pharmacists feel computer systems are becoming a necessity in today's fast-progressing society."

With the increasing number of drug information services available both in Australia and overseas, the traditional method of running pharmacies is changing rapidly. □

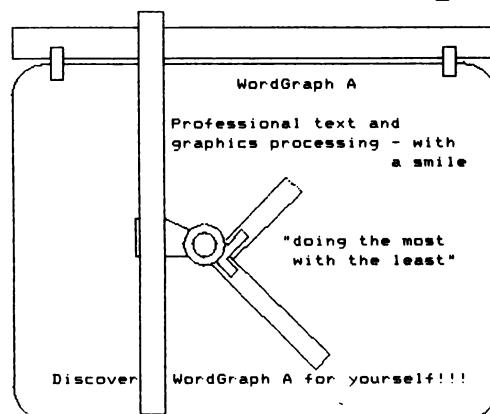
ATTENTION MICROBEE USERS

Now you can satisfy your combined word and graphics processing needs with one sophisticated yet simple to use package:

WordGraph A

AUSTRALIAN MADE

- For freehand sketching or precise drafting on Microbee disk systems.
- Pencil, eraser, ruler, compasses, protractor — all at your finger tips.
- Continuous parameter read out, such as pencil position, ruler angle, compass radius.
- Powerful set-out features
- Zoom editing — draw and edit in fine detail
- Fun to learn, fun to use
- "What you see is what you get" — precise 1-to-1 or scaled hard copy.
- Pictures and text saved on, or retrieved from, disc or printed out — over 80 files possible with editable titles.
- Ideal for illustrated documentation, logos, paper formatting eg. lecture notes, exam papers for maths or science.
- User friendly — menu driven



Please send me WordGraph A! Cheque ☐, or Money Order ☐, enclosed for.

☐ WordGraph A packages @ \$50.00 ea (includes postage and packaging anywhere in Australia).

Name

Address

State P/code Signature

Research Technology Canberra Pty Ltd.

17 Fitzgerald Street,
Yarralumla. ACT. 2600.
Australia. (062) 81-3904.

LOCK THE MONOPOLY board and play-money in a closet and look at the real action, courtesy of Telecom's Viatel. In what is claimed to be one of the most ambitious services yet provided for Viatel subscribers, the John Fairfax publishing group in Sydney is sponsoring detailed and up-to-date inter-city stock exchange information on daily share transactions through the *Australian Financial Review* — almost as they occur.

Called Money Watch, the service makes every computer user a potential stockbroker, with electronic ordering facilities which enable the user to buy and sell through recognised firms at the press of a button.

Money Watch will be patterned on Citiservice, which has been providing British Prestel users with United Kingdom and overseas commodity and financial futures market information since last October.

The service offers colour graphics and bold lettering for ease of reading, and facilities for contacting brokers and giving instructions for trading in shares, trusts and other financial market goodies. Users will be able to shop around via the screen, comparing shares to decide which will be on top at the end of the day.

Money Watch isn't intended only for professional money managers, but also for those who've built up share portfolios as part of other business activities. Private investors can now use a desktop computer to study annual reports, previous share tradings and the entry of new publicly listed companies.

While its supporters claim telebroking creates confidence in and awareness of the markets, the concept clearly has its dark side too. The temptation to fiddle with a favoured stock is high, and an incautious or inexperienced investor could make a decision on the spur of the moment that mightn't turn out to be so lucky. Monopoly is a game, but electronic trading can stimulate a compulsive urge to gamble.

Those protesting that this is unlikely to happen should refer back to the frantic days of the early '70s when Australia's mineral resource stocks were going through the roof and share trading transactions were several days behind the events of the stock exchange floor because brokers couldn't keep pace with the frenetic public clamour for bonds, which in reality were barely worth the paper they were printed on. In the ensuing debacle hundreds of investors lost their savings, and many retired permanently from stock exchange investment. Today the market is

Called Money Watch, the service makes every computer user a potential stockbroker, with electronic ordering facilities which enable the user to buy and sell through recognised firms at the press of a button.

still dominated by professional traders.

The useful aspect is that the prudent investor who up until now has had little to say in the stock market can now become an active trading partner in determining the trends by taking advantage of more immediate access. The scope of private investment can be broadened as more comprehensive statistics on a greater variety of companies become available.

Telebroking can be operated by shopkeepers, contractors, lawyers, accountants or office managers with equal facility, for a relatively nominal cost. Account status reports are being provided to assist users in keeping a check on transactions, so they don't overdose on enthusiasm or optimism.

Just as home banking has opened an enormous potential market for videotex services, so market updates and stock exchange transactions from users of remote computers will allow further expansion of electronic services through Viatel. At the end of June Telecom had 3672 registered users on Viatel, with about an equal proportion of home users to the professional/business segment. Telecom hasn't divided the figures into user groups, but the 'residential' section is believed to include a number of users who have computers at home, which they use for business purposes. One attraction of being a residential user could be the lower registration fee, which applies in the second year.

The June totals also showed growth in the business sector, which appears to be taking off after a slower start than the home-user sector. At the end of March, Viatel's first fully operational month, there

was a total of 983 users, most of them in the residential category. In April this had risen to 1612, but the business sector's enthusiasm became marked mainly during May, which produced a total of 2728 registered users.

There are still too few commercial information databases on Viatel to predict what will be the most sought-after areas, but home banking appears to be prominent in both segments, while vendors offering a variety of products ranging from travel brochures through computer peripherals to umbrella teleshopping are reporting favourable responses. One information provider said that after the company's first month on Viatel, during which it had mainly been advertising its range of goods, it found the two incidental services, games and recipes, which it was offering for free, were also popular. This suggests computers which have been brought into homes for business purposes are also being used for family leisure activities.

Apple Modem

Apple Computer Australia has packaged a data modem with communications software devised by Netcomm of Pymble, NSW, for Macintosh and Apple IIc users who want to access Viatel and other videotex services.

The package is priced at \$795. This may seem a hefty sum for home enthusiasts, but it does offer the professional user a 300 bps and 1200/75 Prestel full-duplex data modem with Hayes Smartmodem compatibility based on the Apple Modem 1200. The modem also has automatic dial and answer and, with communications software, allows remote connection across standard Telecom lines with any approved Australian modem at 300 bps, connection at 1200/75 with a conventional Prestel modem, or connection with any American-standard Bell 103 modem at 300 bps.

Apple says the Macvideotex software makes full use of the Macintosh interface. Users can make complete files of videotex transmissions, or cut and paste from videotex while transmissions continue. Material saved can be incorporated into Macwrite documents may be printed.

On the Apple IIc with Modem 1200, the Videotex II software converts the computer to a fully interactive video terminal, with the ability to save videotex transmissions. The auto-dial, auto-logon and printing facilities also apply. The package has been designed to assist Apple users in acces-

sing facilities such as financial and currency information, banking services, travel booking facilities and current affairs reports. Viatel subscribers will also be able to use the videotex service to send telex messages and communicate through an electronic mailbox when these facilities come on-line late this year or early in 1986, and to download programs and data files currently being compiled.

Tandata Manufacture

Plans are in an advanced stage for Australian distributor GEC Digital of North Ryde in Sydney to manufacture the Tandata range of keyboard terminals and modems for Viatel and other videotex services in Australia. GEC Digital was appointed distributor of the British-made Tandata products toward the end of last year, but has kept a low profile while it looked into local manufacture of the products.

Moves towards Australian production have been stimulated since a decision last May by Australian customs to impose a 30 per cent tariff on all videotex goods imported from overseas. Customs has the power to enforce this levy if approached by an Australian company which is making or intends to make similar products and requests price protection so it can't be undercut by imports. Although the names of those applying to customs in the videotex equipment area haven't been revealed, industry sources believe at least two companies are involved.

Marketing manager of GEC Digital, Terry Crewes, said the tariff protection would mean higher prices across the board for Australian products. Confirming that GEC Digital was preparing to set up local manufacture for a number of units, Crewes said the company would probably have to sell these at a higher price than the identical imported models because Australia couldn't achieve the same economical scale of manufacture as the United Kingdom.

GEC Digital and several other companies, including AWA, Philips, Sony and Rank Electronics, have asked the government not to remove the tariff concessions on imports. These companies claim the industry could provide better and more economic facilities and services if videotex terminals and adaptors were treated in the same way as personal computers, with a bounty for local production and import duty retained at the existing two per cent.

Data need converting?



Let us do it for you

Fast economical conversion between different operating systems and different disc types.

THE NASHUA DATA CONVERTER

Provides unique file transfers and conversions between different operating systems including CPM, CPM86, PC DOS, MSDOS and UNIX without the need for time consuming unreliable serial links. Conversions are available using any combination of 8", 5¼" and 3½" diskettes. Tape to diskette conversions are also provided for. The Nashua Conversion System is unique in that it emulates the file systems on over 450 different disc formats and provides full verification for all conversions, e.g., (1) NEC A.P.C. III using MSDOS to IBM P.C. using PC DOS

with 5¼" diskettes. (2) NEC A.P.C. II using CPM86 with 8" diskettes to IBM P.C. using PC DOS with 5¼" diskettes.

FORMATTING AND COPYING

With our library of over 450 different formats and continual updates, we offer high speed formatting and copying with full verification at our "Direct Sales Centres".

ACQUIRE YOUR OWN CONVERTER

If you have a large and steady volume of conversion work, it could well be an economical proposition to HAVE YOUR OWN Nashua High Speed Data Converter. We'll be glad to give you the details.

Call us today. Let us solve your problems and save you time and money.

Available only from:

Nashua Discs Direct Sales Centre.



New South Wales: 48 Frenchs Road, Willoughby 2068. Phone: (02) 958 2044.

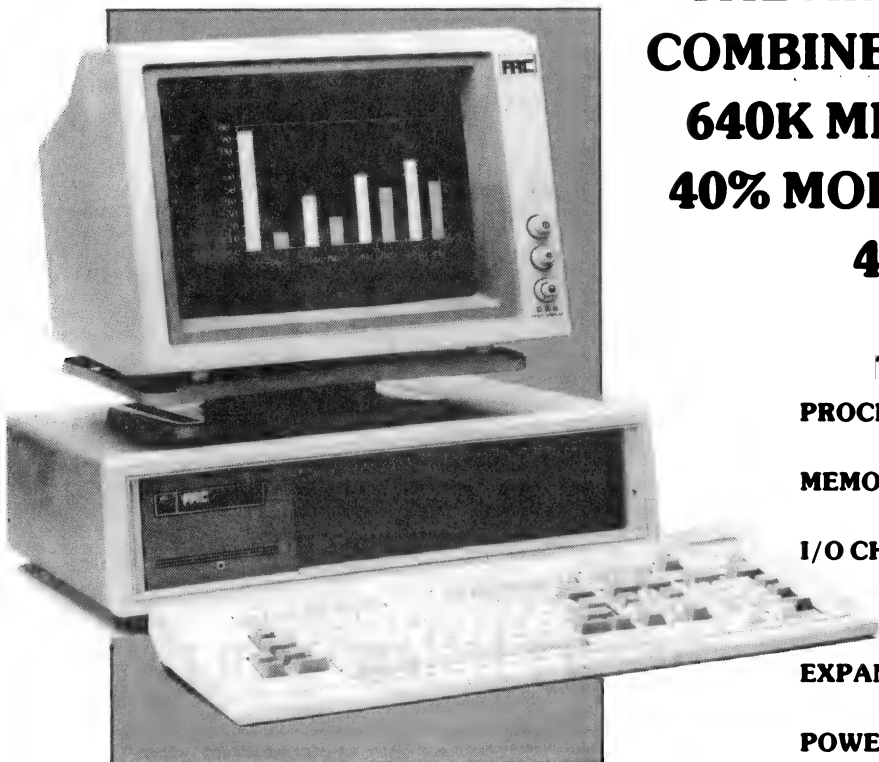
Australian Capital Territory: 71 Constitution Avenue, Campbell 2601. Phone: (062) 47 0511.

Victoria: 523 Victoria Street, Abbotsford 3067. Phone: (03) 428 0501.

Queensland: 91 Petrie Terrace, Brisbane 4000. Phone: (07) 369 4244.

South Australia: 31 The Parade, Norwood 5067. Phone: (08) 42 0021.

Western Australia: 131 Summers Street, East Perth 6000. Phone: (09) 328 1888.



THE ARC TURBO COMPUTER COMBINES 8088-2 SPEED WITH 640K MEMORY TO GIVE YOU 40% MORE PERFORMANCE AT 40% LESS COST

TECHNICAL SPECIFICATIONS

PROCESSOR	CPU 8088-2 @ 4.77/6.7 MHz Optional 8087/2 co-processor
MEMORY	RAM 640Kb Standard on Board
I/O CHANNELS	Disk Controller, Parallel Printer (Centronics) Dual RS232 Serial & Game Interface Clock & Calendar.
EXPANSION SLOTS	Total of eight Expansion Slots (two are occupied).
POWER SUPPLY	200W Power switching power supply.
DISK DRIVES	Dual DS/DD 5¼" 360Kb Disk Drives. Optional 20Mb Hard Disk Drive.
KEYBOARD	99 Keys including special function keys. (5151-type.)
MONO DISPLAY	Taxan 12" P39 green or amber display 80 chrs x 25 lines.
COLOUR DISPLAY	Taxan 12" Hi-res Colour Display 40/80 chrs x 25 lines.
SOFTWARE	MS-DOS 3.1 operating system RAM disk & printspool software.

- The ARC turbo features a high level of quality and user oriented technology.
- The ARC is backed Australia-wide by a 12 month warranty.
- A growing network of agents provide support and backup.

PRODUCT HIGHLIGHTS

8088-2 Turbo processing
640 Kb RAM Standard
6 Free Expansion Slots
12 Month Warranty
Choice of Mono and Colour Displays.
Superior keyboard

**Contact us for more information and the
name of your nearest dealer**

DEALER ENQUIRIES WELCOME.

MS-DOS is a Registered Trademark of Microsoft Corp.
 ARC is a Registered Trademark of American Research Corporation

Distributed by: Consultech Australia Pty. Ltd., 271 Blackburn Road, Mt. Waverley, Vic. 3149. Phone (03) 233-8999

VZ200

YAHTZEE

This is a VZ200 version for the dice game Yahtzee, designed for an unlimited number of players.

Each player throws his or her dice up to three times each turn. After the first and second throws you can hold any dice you wish to keep, re-throwing the balance. After the third throw you must enter your score in the table provided.

Once a score has been recorded for a particular category, that category can't be used again. The game ends after 13 rounds.

Because of the limitations of the printer used to produce the listing it's wise to include the graphics [shift Js] in lines 2020 and 2050. The sections underlined should be inserted in inverse text.

The program occupies 5.9 Kbytes of memory.

Ian Thompson,
Collaroy Plateau, NSW

Main Variable Used

N\$()	Player's name
S\$()	Titles of category
S2\$()	Description of category
SC\$()	Update score for each category
DF()	Spots on dice
SC()	Score
ND()	Random number for dice
NP	Number of players
IP	User update of scoresheet
TURN	Turn number

Main Routines

0-46	Title graphics
100	Initialises screen background
	Clears memory for variables
130	Input players' names
140	Initialises variables
160-170	Input players names
165	Limits player's name to 11 characters
180-190	Set number of player turns per number of players
210	Random number generator for dice throw
290-320	Print score table
330-420	User update of score
470-570	Updates total score
600-650	Displays final score and placings
1000-1120	Data statements for score table
1130-1160	Data statements for spots on dice
2020-2050	Displays dice
9000-20040	User update of score subroutine
21000-22140	Instructions

```

0 '*****
1 '* VZ-200 Y A H T Z E E *
2 '* IAN THOMPSON - COLLAROY *
3 '*****
4 CLS:SOUND 25,6:COLOR,0
5 FOR X=1 TO 32:POKE 28671+X,204:POKE 29151+
X,195
6 POKE 28672,174:POKE 28703,173:POKE 29152,1
71:POKE 29183,167
7 NEXT X
8 FOR N=28704 TO 29120 STEP 32
9 POKE N,202
10 NEXT N
11 FOR O=28735 TO 29151 STEP 32
12 POKE O,197
13 NEXT O
22 PRINT@106," YAHTZEE "
24 A$=" IAN A.THOMPSON "
26 B$="COLLARROY PLATEAU"
28 FOR N=1 TO LEN(A$)
30 PRINT@231,RIGHT$(A$,N);
32 PRINT@263,RIGHT$(B$,N);
34 NEXT
35 FOR I=1 TO 500:NEXTI
36 PRINT@454,"INSTRUCTIONS (Y/N)?"
38 IF INKEY$<>" " THEN 38
40 A$=INKEY$
42 IF A$="N" THEN SOUND30,1:GOTO100
44 IF A$<>"Y" THEN 40
45 SOUND30,1
46 GOSUB 21000:'INSTRUCTIONS
100 POKE 30744,0:COLOR 5,0:CLEAR 1000
120 R=RND(0)
130 CLS:PRINT@128,"NO. OF PLAYERS";:INPUT NP
135 SOUND 31,1
140 DIM SC$(13,NP),S1$(13),S2$(13),N$(NP),DF
(6,6),SC(NP),YF(NP)
145 GOSUB 1000
150 FOR I=1 TO NP
160 CLS:PRINT@128,"PLAYER #";I;:INPUT" 'S NAM
E";N$(I)
162 SOUND 31,1
165 IF LEN(N$(I))>11 THEN SOUND 20,1;10,1:GO
TO 160
170 NEXT
180 FOR TURN = 1 TO 13
190 FOR PL=1 TO NP
210 FOR R=1 TO 5:ND(R)=RND(6):NEXT
220 GOSUB 2000
230 GOSUB 3000
240 PRINT@416,"REMEMBER THESE,THEN"
250 PRINT"HIT ANY KEY TO CONTINUE":A$=INKEY$
260 A$=INKEY$:IF A$="" THEN 260
270 FOR I=1 TO 6:N(I)=0:NEXT
280 FOR I=1 TO 5:N(ND(I))=N(ND(I))+1:NEXT
290 CLS:PRINT"CHOOSE A CATEGORY,";N$(PL)
300 FOR I=1 TO 13:PRINTUSING"###" ";I;
310 PRINTS1$(I);S2$(I);SC$(I,PL)
320 NEXT
330 PRINT:INPUT"WHICH [1-13]";IP
340 IF IP<1 OR IP>13 THEN 290
345 IF IP=12 THEN 12000
350 IF SC$(IP,PL)<>" " THEN 15000
360 IF IP<7 THEN SC$(IP,PL)=STR$(IP*N(IP))
370 IF IP=7 OR IP=8 THEN 7000
380 IF IP=9 THEN 9000
390 IF IP=10 THEN 10000
400 IF IP=11 THEN 11000
420 IF IP=13 THEN 13000

```


VZ200

```

430 NEXT PL:NEXT TURN
440 FOR PL=1 TO NP:FOR I=1 TO 13
460 NEXT
470 FOR I=1 TO 6
480 SC(PL)=SC(PL)+VAL(SC$(I,PL)):NEXT
490 IF SC(PL)>62 THEN SC(PL)=SC(PL)+35
500 FOR I=7 TO 13
510 SC(PL)=SC(PL)+VAL(SC$(I,PL))
520 NEXT:NEXT
530 FOR I=1 TO NP-1
540 HI=0:FOR J=1 TO NP
550 IF SC(J)>HI THEN HI=SC(J):P=J
560 NEXT
570 D=SC(I):SC(I)=SC(P):SC(P)=D
580 D$=N$(I):N$(I)=N$(P):N$(P)=D$
585 NEXT
590 SOUND 20,1:SOUND 10,1:SOUND 20,1
600 CLS:PRINT"AND THE PLACINGS ARE:"
620 PRINT:PRINT:FOR I=1 TO NP
630 PRINTUSING"###J ";I:
640 PRINT"J ";N$(I):TAB(25):SC(I)
650 NEXT
660 PRINT@480,"ANOTHER GAME (Y/N)?":
670 GOSUB 20000
680 IF YN$="Y" THEN RUN
690 CLS:PRINT@160,"THANKS FOR THE GAME BYE
":END
1000 'DATA STATEMENTS
1040 FOR I=1 TO 13
1050 READ S1$(I),S2$(I):NEXT
1060 DATA"ACES",". [SUM OF 1'S] -","TWOS",
". [SUM OF 2'S] -"
1070 DATA"THREES",". [SUM OF 3'S] -","FOURS",
". [SUM OF 4'S] -"
1080 DATA"FIVES",". [SUM OF 5'S] -","SIXES",
". [SUM OF 6'S] -"
1090 DATA"3 OF A KIND",". [SUM] -","4 OF A
KIND",". [SUM] -"
1100 DATA"FULL HOUSE",". [25] -","SM. STR
AIGHT",". [30] -"
1110 DATA"LG. STRAIGHT",". [40] -","YAHTZEE
",". [50] -"
1120 DATA"CHANCE",". [SUM] -"
1130 FOR I=1 TO 6:FOR J=1 TO I
1140 READ DF(I,J):NEXT:NEXT
1150 DATA 66,33,99,1,66,131,33,35,97,99
1160 DATA 1,3,66,129,131,1,3,65,67,129,131
1190 RETURN
2000 CLS:PRINT N$(PL):"'S ROLL"
2010 FOR R=96 TO 224 STEP 32:FOR S=2 TO 26 S
TEP 6
2015 COLOR 5
2020 PRINT@R+S," ";'THREE SHIFT J'S
2030 NEXT:NEXT
2040 FOR D=1 TO 5:FOR N=1 TO ND(D)
2045 COLOR 3
2050 PRINT@91+D*6+DF(ND(D),N)," ";'ONE SHIFT
J
2060 NEXT:NEXT
2070 RETURN
3000 FOR K=1 TO 2:F=1
3010 FOR J=1 TO 5
3020 P=252+J*6:RR(J)=0
3030 PRINT@P,"^^^^"
3035 PRINT:PRINT
3040 PRINT"REROLL THIS ONE [Y/N]?"
3050 PRINT"[S FOR SCOREBOARD]:PRINT"[M FOR
MISTAKE]":YN$=INKEY$
3060 YN$=INKEY$
3070 IF YN$<>"Y" AND YN$<>"N" AND YN$<>"S" A
ND YN$<>"M" THEN3060
3072 IF YN$="Y" THEN SOUND 20,1
3074 IF YN$="N" THEN SOUND 10,1
3076 IF YN$="S" THEN SOUND 15,1
3078 IF YN$="M" THEN SOUND 20,2:10,1
3080 IF YN$<>"S" THEN 3130
3090 CLS:PRINT TAB(5):N$(PL):"'S SCORES"
3100 FORI=1TO13:PRINTUSING"###J ";I:
3105 PRINT S1$(I):S2$(I):SC$(I,PL)
3110 NEXT:PRINT"HIT ANY KEY TO RETURN:":A$=I
NKEY$
3120 A$=INKEY$:IF A$="" THEN 3120 ELSE GOSUB
2000:GOTO 3020
3130 PRINT@F," "
3140 IF YN$="M" THEN 3010
3150 IF YN$="Y" THEN RR(J)=1
3160 NEXT
3170 FOR I=1 TO 5:IF RR(I)=1 THEN ND(I)=RND(
6):F=0
3180 NEXT:IF F THEN K=2
3190 GOSUB 2000
3200 NEXT
3210 RETURN
7000 FOR I=1 TO 6:IFN(I)>IP-5 THEN 7030
7010 NEXT
7020 GOTO 16000
7030 SC=0
7040 FOR I=1 TO 5:SC=SC+ND(I):NEXT
7050 SC$(IP,PL)=STR$(SC)
7060 GOTO 430
9000 FOR I=1 TO 6
9010 IF N(I)>2 THEN N(I)=N(I)-3:GOTO 9040
9020 NEXT
9030 GOTO 16000
9040 FOR I=1 TO 6
9050 IF N(I)>1 THEN 9080
9060 NEXT
9070 GOTO 16000
9080 SC$(9,PL)=" 25"
9090 GOTO 430
9090 GOTO 430
10000 FOR I=1 TO 3:F=1:FOR J=I TO I+3
10010 IF N(J)=0 THEN F=0
10020 NEXT
10030 IF F THEN 10060
10040 NEXT
10050 GOTO 16000
10060 SC$(10,PL)=" 30"
10070 GOTO 430
11000 FOR I=1 TO 2:F=1:FOR J=I TO I+4
11010 IF N(J)=0 THEN F=0
11020 NEXT
11030 IF F THEN 11060
11040 NEXT
11050 GOTO 16000
11060 SC$(11,PL)=" 40"
11070 GOTO 430
12000 FOR I=1 TO 6
12010 IF N(I)=5 THEN 12040
12020 NEXT
12030 GOTO 16000
12040 SC$(12,PL)=" 50"
12050 IF YF(PL) THEN SC$(12,PL)=STR$(VAL(SC$
(12,PL))+100)
12060 YF(PL)=1
12070 GOTO 430
13000 SC=0:FOR I=1 TO 5
13010 SC=SC+ND(I):NEXT
13020 SC$(13,PL)=STR$(SC)
13030 GOTO 430

```

VZ200

```

15000 SOUND 15,1:CLS
15010 PRINT@128,"YOU'VE ALREADY DONE"
15020 PRINT"THE ";S1$(IP);" ";N$(PL)
15030 FOR I=1 TO 2000:NEXT
15040 GOTO 290
16000 SOUND 15,1:CLS
16010 PRINT@128,"YOU'RE NOT ELIGIBLE FOR"
16020 PRINT"A ";S1$(IP);" ";N$(PL)
16025 IF IP=12 AND YF(PL) THEN SOUND 0,8:GOT
O 290
16030 PRINT:PRINT:PRINT"DO YOU WANT IT ANYWA
Y [Y/N]?";
16040 GOSUB 20000
16050 IF YN$="N" THEN 290
16060 SC$(IP,PL)=" O"
16070 IF IP=12 THEN YF(PL)=1
16080 GOTO 430
20000 YN$=INKEY$
20010 YN$=INKEY$:IF YN$="" THEN 20010
20020 IF YN$<>"Y" AND YN$<>"N" THEN 20000
20030 IF YN$="Y" THEN SOUND 20,1 ELSE SOUND
10,1
20040 RETURN
21000 CLS:PRINT"INSTRUCTIONS"
21010 PRINT:PRINT"IN THIS DICE GAME EACH PLA
YER"
21020 PRINT"CAN THROW UP TO THREE TIMES EACH
";
21030 PRINT"TURN. AFTER THE FIRST THROW, HE"
21040 PRINT"CAN SET ASIDE ANY DICE HE WISHES
";
21050 PRINT"TO KEEP,AND RETHROW THE BALANCE.
";
21060 PRINT"HE CAN DO THE SAME AFTER THE"
21070 PRINT"SECOND AND THIRD THROWS. HE CAN,
";
21080 PRINT"OF COURSE, STOP BEFORE THE THIRD
";
21090 PRINT"THROW IF HE WISHES."
21100 PRINT"ONCE THE PLAYER HAS DECIDED TO"
21110 PRINT"STOP, HE MUST DECIDE INTO WHICH"
21120 PRINT"CATEGORY TO ENTER HIS SCORE."
21130 GOSUB 22100
21140 DIM S1$(13),S2$(13)
21150 FOR I=1 TO 13
21152 READ S1$(I),S2$(I):NEXT
21154 CLS
21156 PRINT
21160 FOR I=1 TO 13
21170 PRINT S1$(I);S2$(I):NEXT
21172 PRINT@300,"[SUM OF HOUSE] -"
21174 PRINT@334,"[1,2,3,4,5,] -"
21176 PRINT@366,"[2,3,4,5,6,] -"
21178 PRINT@394,"[FIVE OF A KIND] -"
21180 PRINT@427,"[ANY FIVE DICE] -"
21200 GOSUB 22100
21210 CLS:PRINT"THE GAME ENDS AFTER 12 ROUND
S."
21220 PRINT"ONCE A SCORE HAS BEEN RECORDED"
21230 PRINT"FOR A PARTICULAR CATEGORY, THAT"
21240 PRINT"CATEGORY CAN'T BE USED AGAIN."
21250 GOSUB 22100
21260 RETURN
22100 PRINT@485,"PRESS <C> TO CONTINUE";
22110 IF INKEY$<>"C" THEN 22100
22120 IF INKEY$="" THEN 22100
22130 IF INKEY$="C" THEN 22130
22140 SOUND 30,1:RETURN

```

Most BASICs

SORTING OUT
THE SORTS

The program listed with this article was developed to test the speed and efficiency of four sorting algorithms: Insertion, Shell, Quick and Selection. The program will probably run as is in most BASICs.

What's usually required of a sort is to put a list of names into alphabetical order, but the average textbook seems to present sorts for numbers with no indication of the best choice for a particular task.

The choice of sorting algorithms is broad: more than three dozen are known, spread across some hundred texts. The most popularly presented, and the slowest if list size is more than 11, is the bubble sort.

Fortunately, the choice can be narrowed down to short algorithms which work in RAM only and are not bubbly sorts in disguise!

The program

The first program line, line 30, asks for the size of the array to be generated and sorted. Start with a choice of 10 to check the sorts are working as expected.

Lines 70-130 generate the required number of capital letters and place them in the array. The variable CD is set at 64, one less than the ASCII code for 'A'. A number is generated in line 90 and added to CD. If this number is acceptable, the character it represents is placed in array CH\$. If not, C is decremented by one and the process is repeated. The loop runs until BN (big number!) letters are placed in the array. Line 130 prints out the unsorted list and could be omitted from the program.

The straight Insertion sort and the Shell (insertion algorithm) sort are particularly useful.

The Selection sort is always the slowest, since the same number of compares and swaps is made if the list is random, or if only one element is out of order. The Quick sort isn't much better if only a few

Most BASICs

elements are out of order. If the list is random with more than 500 elements Quick sort is useful, but only if there is no shortage of RAM to store the two extra arrays the sort requires.

The Shell sort is best for a random list, and the Insertion sort is best when only a few items in the list are out of order. For most work the Insertion sort will do. For instance, a mailing list is only truly random when first typed in, and thereafter only insertions need to be sorted. The Insertion sort is simplest to understand: search forward for an out-of-order element, then search back through the list and insert the element in its proper place. The Shell sort is a little more complicated: elements compared are a specified distance apart, which decreases until only adjacent elements are compared.

Mr Jankowski,
Timaru, New Zealand

```

10 REM SORT MEASURE by LZ Jankowski
15 REM COPYRIGHT July 1985
20 :
30 CLS: INPUT "# of items in list "; BN: CLS
40 DIM CH$(BN), A(BN), B(BN)
50 :
60 REM -----Create random list of letters-----
70 CLS: PRINT TAB(20)"* Programming *": CO=64
80 FOR C=1 TO BN: CO=CO+10: IF CO=94 THEN CO=64
90 : X=INT(10*RND(1))+CO
100 : IF X<65 OR X>90 THEN C=C-1: GOTO 120
110 : CH$(C)=CHR$(X)
120 NEXT : CLS: PRINT "Random list is": PRINT : PRINT
130 FOR C=1 TO BN: PRINT C=" " CH$(C) SPC(4): NEXT : PRINT : PRINT
140 :
150 REM -----MENU-----
160 PRINT : PRINT : PRINT : PRINT TAB(15)"1> Insertion Sort"
170 PRINT TAB(15)"2> Shell Sort"
180 PRINT TAB(15)"3> Quick Sort": PRINT TAB(15)"4> Selection Sort"
190 PRINT : INPUT "Choice "; C
200 IF C<1 OR C>4 THEN RUN
210 :
220 PRINT !:(28): PRINT "* Sorting *": PRINT : PRINT
230 ON C GOSUB 500, 400, 570, 750: GOSUB 350
240 :
250 REM -----Now sort 'A' from bottom to top of list-----
260 FOR C=1 TO 40: PRINT "-": NEXT
270 PRINT : PRINT "Sorting 'A' from bottom to top of list": PRINT
280 GOSUB 500: GOSUB 350: GOSUB 400: GOSUB 350
290 GOSUB 570: GOSUB 350: GOSUB 750: GOSUB 350
300 :
310 PRINT : INPUT "RUN again "; Q$: IF LEFT$(Q$,1)="Y" THEN RUN
320 END
330 :
340 REM -----Print sorted list & # of compares & swaps-----
350 FOR C=1 TO BN: PRINT C =" " CH$(C) SPC(4): NEXT
360 PRINT : PRINT : PRINT "Compares= "CM,"Swaps= "S: PRINT
370 CH$(BN)="A": CM=0: S=0: RETURN
380 :
390 REM -----Shell sort based on Insertion algorithm-----
400 I=(2*INT(LOG(BN)/LOG(2)))-1
410 I=INT(I/2)
420 IF I<1 THEN 470
430 FOR N=1 TO I: FOR C=N+1 TO BN STEP I: M=C: C#=CH$(M)
440 CM=CM+1: IF CH$(M-I)<=C# THEN 460
450 CH$(M)=CH$(M-I): S=S+1: M=M-I: IF M>I THEN 440
460 CH$(M)=C#: NEXT C: NEXT N: GOTO 410
470 PRINT "SHELL SORT": RETURN
480 :
490 REM -----Insertion Sort-----
500 FOR N=2 TO BN: M=N: C#=CH$(M)
510 CM=CM+1: IF CH$(M-1)<=C# THEN 530
520 S=S+1: CH$(M)=CH$(M-1): M=M-1: IF M>1 THEN 510
530 CH$(M)=C#: NEXT
540 PRINT "INSERTION SORT": RETURN
550 :
560 REM -----Quicksort best for very long, random lists-----
570 SP=1: A(1)=1: B(1)=BN
580 FI=A(SP): SI=B(SP): SP=SP+1
590 SF=FI: SS=SI: C#=CH$(INT((FI+SI)/2))
600 CM=CM+1: IF CH$(SF)>=C# THEN 630
610 SF=SF+1
620 GOTO 600
630 CM=CM+1: IF C#>=CH$(SS) THEN 650
640 SS=SS-1: GOTO 630
650 IF SF>SS THEN 670
660 S=S+1: E#=CH$(SF): CH$(SF)=CH$(SS): CH$(SS)=E#: SF=SF+1: SS=SS-1
670 IF SF<=SS THEN 600
680 IF SF>=SI THEN 700
690 SP=SP+1: A(SP)=SF: B(SP)=SI
700 SI=SS: IF FI<SI THEN 590
710 IF SP>0 THEN 580
720 PRINT "QUICKSORT": RETURN
730 :
740 REM -----Selection Sort, dreadful! CM=(N-1)*N/2 Swaps=N-1--
750 FOR N=1 TO BN-1: M=N: FOR C=N+1 TO BN: CM=CM+1: IF CH$(M)>CH$(C) THEN M=C
760 NEXT: S=S+1: C#=CH$(N): CH$(N)=CH$(M): CH$(M)=C#: NEXT
770 PRINT "SELECTION SORT": RETURN

```

Microbee

```

00100 REM BANNER 7/1/85 Richard Larkin.
00110 DIM D0(7)
00120 STR$(2000) : FOR A=0 TO 7 : D0$(A)=" " : NEXT A
00130 CLS : PRINT "PLEASE ENTER BANNER" : INPUT I0$ : T=LEN(I0$)
00140 INPUT "MARGIN" M : IF M<0 THEN 140
00150 INPUT "WIDTH" W : IF W<1 THEN 150
00160 PRINT "COLUMNS ON PRINTER" \ "1) 40" \ "2) 80" \ "3) 132"
00170 K1$=KEY : IF K1$="1" : C=40 ELSE IF K1$="2" : C=80 ELSE IF K1$="3" : C=132
      ELSE 170
00180 H=(C-M)/16 : E=C-M-H*16 : OUTL#1 : LPRINT CHR(32-INT(VAL(K1$))) : REM (- I
      S CTRL CODE FOR DIFFERENT COLUMN WIDTHS
00190 IF E<0 OR H<1 THEN PRINT "ERROR IN DATA PLEASE TRY AGAIN." : I=USR(32774)
      : RUN
00200 A2$="" : IF E>0 : FOR A=1 TO E : A2$=A2$+" " : NEXT A
00210 A1$="" : IF M>0 : FOR A=1 TO M : A1$=A1$+" " : NEXT A
00220 C0$="" : C1$="" : FOR A=1 TO H : C0$=C0$+" " : C1$=C1$+" " : NEXT A
00230 FOR A=1 TO T : REM LOOP TO DO EACH LETTER
00240 FOR B=0 TO 7 : D0$(B)=" " : NEXT B
00250 N0$=I0$(A,A) : P=63488+16*ASC(N0$) : REM FIND ADDRESS OF LETTER DATA
00260 FOR C=P TO P+15
00270 I=PEEK(C) : REM GET FIRST PIECE OF DATA
00280 FOR D=0 TO 7
00290 IF I>127 : I=I-128 : A0$=C0$ ELSE LET A0$=C1$
00300 D0$(D)=A0$+D0$(D) : I=I*2 : REM AND CREATE LARGE LETTER
00310 NEXT D
00320 NEXT C
00330 FOR B=0 TO 7
00340 FOR C=1 TO W
00350 LPRINT A1$ D0$(B) A2$ : REM PRINT LETTER CREATED
00360 NEXT C
00370 NEXT B
00380 NEXT A
00390 LPRINT \ \ \ \ : RUN

```

BANNER

Banner is one of those programs that prints (believe it or not) banners. You type in what you want and say how many columns your printer has and how wide you would like the letters. Then it happily spews forth with giant letters on your printer. The OUTL# command may have to be changed for different printers, and the control code sent to the printer to put it in the column mode you want probably also needs changing if you have a weird printer. But it's very easy to fix.

Richard Larkin
Dee Why, NSW

“CHARLIE’S CASHBOOK”

Any “Charlie” Can Use It!

“Cashbook” is two programs in one . . . both working together. The *first* manages **all** your bank accounts and the *second* manages your expense ledgers. “Cashbook” will **save hours** of your accountant’s valuable time and provide ‘up-to-date’ financial reports . . . whenever you require them!

But, What Does It Do?

- Ultra fast
- Multi-Company or Department
- Multiple Bank Bank Accounts
- Detailed Bank Reports
- Detailed Expense Reports
- Full Bank reconciliation
- Comprehensive documentation
- Runs on IBM and compatibles

SPECIAL OFFER: PHONE YOUR ORDER THROUGH NOW! . . . AND WE
ON YOUR DESK IN THE MORNING

\$499



Charlie’s Computer Products

P.O. Box 513, South Perth, W.A. 6151

PHONE: (09) 367-7532

★ Dealer Enquiries
Welcomed ★

Microbee

CATTER

Catter is one of those annoyingly addictive games. The idea is to eat all the mushrooms, but Catter gets longer each time you indulge, and it tends to wander if not well controlled. Result? Very hard to survive the eight rounds — well, on level 3 it is.

Richard Larkin
Dee Why, NSW

00100 REM CATTER 13/4/85 RICHARD LARKIN.

00110 CLS : NORMAL : PRINT "CATTER" : "YOU ARE IN CHARGE OF A CATERPILLAR WHICH IS RATHER FIDGETY. IT NEVER STOPS! SO YOU HAVE TO, AS BEST YOU CAN, HEAD IT TOWARDS"

00120 PRINT "ITS MEAL, MUSHROOMS, BUT ONLY THE RIPE ONES. " : "USING THE 'A', 'Z', 'C' AND 'X' KEYS CONTROL THE CATERPILLARS' DIRECTION. IF YOU DON'T IT WILL!"

00130 PRINT "GAME ENDS WHEN THE CATERPILLAR CANNOT MOVE. " : "OR IF YOU SURVIVE 8 ROUNDS. " : "GOOD LUCK!" : POKE 162,30 : POKE 163,128 : POKE 257,2

00140 FOR X=-2016 TO -2001 : READ Y : POKE X,Y : POKE X+16,Y : POKE X+32,Y : POKE X+48,Y : NEXT X

00150 FOR X=-1952 TO -1937 : READ Y : POKE X,Y : POKE X+16,Y : POKE X+32,Y : POKE X+48,Y : NEXT X

00160 FOR X=-1888 TO -1793 : READ Y : POKE X,Y : NEXT X : FOR X=-3072 TO -3009 : POKE X,255 : NEXT X

00170 DATA 3,12,16,40,83,64,137,138,138,137,64,83,40,16,12,3

00180 DATA 192,48,8,20,202,2,145,81,81,145,2,202,20,8,48,192

00190 DATA 0,0,15,48,64,64,128,128,159,98,2,4,4,8,8,15

00200 DATA 0,15,63,127,127,255,255,255,126,3,7,7,15,15,15,0

00210 DATA 1,3,7,15,31,63,127,255,255,127,63,31,15,7,3,1

00220 DATA 128,192,224,240,248,252,254,255,255,254,252,248,240,224,192,128

00230 DATA 0,0,240,12,2,2,1,1,249,70,64,32,32,16,16,240

00240 DATA 0,240,252,254,254,255,255,255,70,192,224,224,240,240,240,0

00250 DIM P(15),Z(3),D(3),N(3)

00260 FOR X=0 TO 3 : READ Z(X),D(X) : N(X)=X : NEXT X : PRINT "ANY KEY TO CONTINUE."

00270 DATA 150,-64,131,2,132,64,133,-2

00280 T=1 : R=1 : S=0 : I=USR(32774) : CURS 21,12 : PRINT "SKILL LEVEL (1 TO 3)"

00290 F=52-ASC(KEY) : IF F)3 OR F(1 THEN 290

00300 Q=24 : U=0 : Y0=0 : CLS : NORMAL : CURS 19,1 : PRINT "CATTER-by Richard La" : CURS 27,8 : PCO : PRINT "ROUND=" : R

00310 L=8 : FOR X=-3076-L*2 TO -3074 STEP 2 : POKE X,133 : POKE X+1,137 : NEXT X : E=-3074 : H=-3076-L*2 : G=3

00320 I0=FLT(R)/FLT(F)+1 : CURS 23,9 : PRINT " SCORE = " : FOR X=0 TO 15

00330 P(X)=-4096+INT(RND*512)*2 : IF PEEK(P(X))=32 THEN POKE P(X),138 : POKE P(X)+1,142 : NEXT X ELSE 330

00340 Q=Q-1 : IF Q=0 : POKE P(U),138+T : POKE P(U)+1,142+T : Q=3 : T=1-T

00350 CURS 31,9 : PRINT S" " : S=S-1 : C=0 : A=PEEK(258) : IF A=26 : G=2 ELSE IF A=1 : G=0 ELSE IF A=44 : G=3 ELSE IF A=46 : G=1

00360 IF H+D(G)-3073 OR H+D(G)-4096 : G=C

00370 O=H : H=H+D(G) : IF H()P(U) THEN 380 ELSE POKE H,32 : POKE H+1,32 : S=S+10 : U=U+1 : PLAY U : H=0 : G=C : Y0=Y0+10 : T=0 : Q=2 : IF U(16 THEN 340 ELSE 430

00380 IF PEEK(H)=32 AND H)-4096 AND H(-3073 THEN 400

00390 S=S-5 : H=0 : FOR X=3 TO 0 STEP -1 : A=INT(RND*FLT(X+1)) : B=N(A) : N(A)=N(X) : N(X)=B : IF PEEK(H+D(B))=32 OR H+D(B)=P(U) : G=B : NEXT X 370 ELSE NEXT X : GOTO 450

00400 POKE O,Z(G) : POKE O+1,Z(G)+4 : POKE H,140 : POKE H+1,141

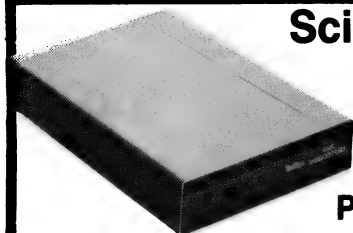
00410 IF Y0)1 AND Q=1 : Y0=Y0-1 ELSE LET C=PEEK(E) : POKE E,32 : POKE E+1,32 : E=E+D(C-130)

00420 OUT (2),255 : FOR Y=0 TO 64-U*4 : NEXT Y : OUT(2),0 : GOTO 340

00430 R=R+1 : PLAY 91618141712 : IF R(=0 THEN GOTO 300

00440 NORMAL : CURS 25,10 : PRINT " WELL DONE! " : CURS 19,11 : PRINT " YOU SURVIVED 8 ROUNDS! " : PLAY 9118121713161415 : GOTO 280

00450 NORMAL : PLAY 1,10 : CURS 27,10 : PRINT "BAD LUCK" : GOTO 280



SciSys Parallel Wordstore

A 64K Print Spooler/Buffer
complete with Centronics cable,
copy function, pause button, self
test. A LOW COST way to
increase your computer efficiency.

PRICE — \$299.00 Tax Paid.



539 PITTSWATER RD., BROOKVALE 2100. (02) 93-1383, (02) 908-1718

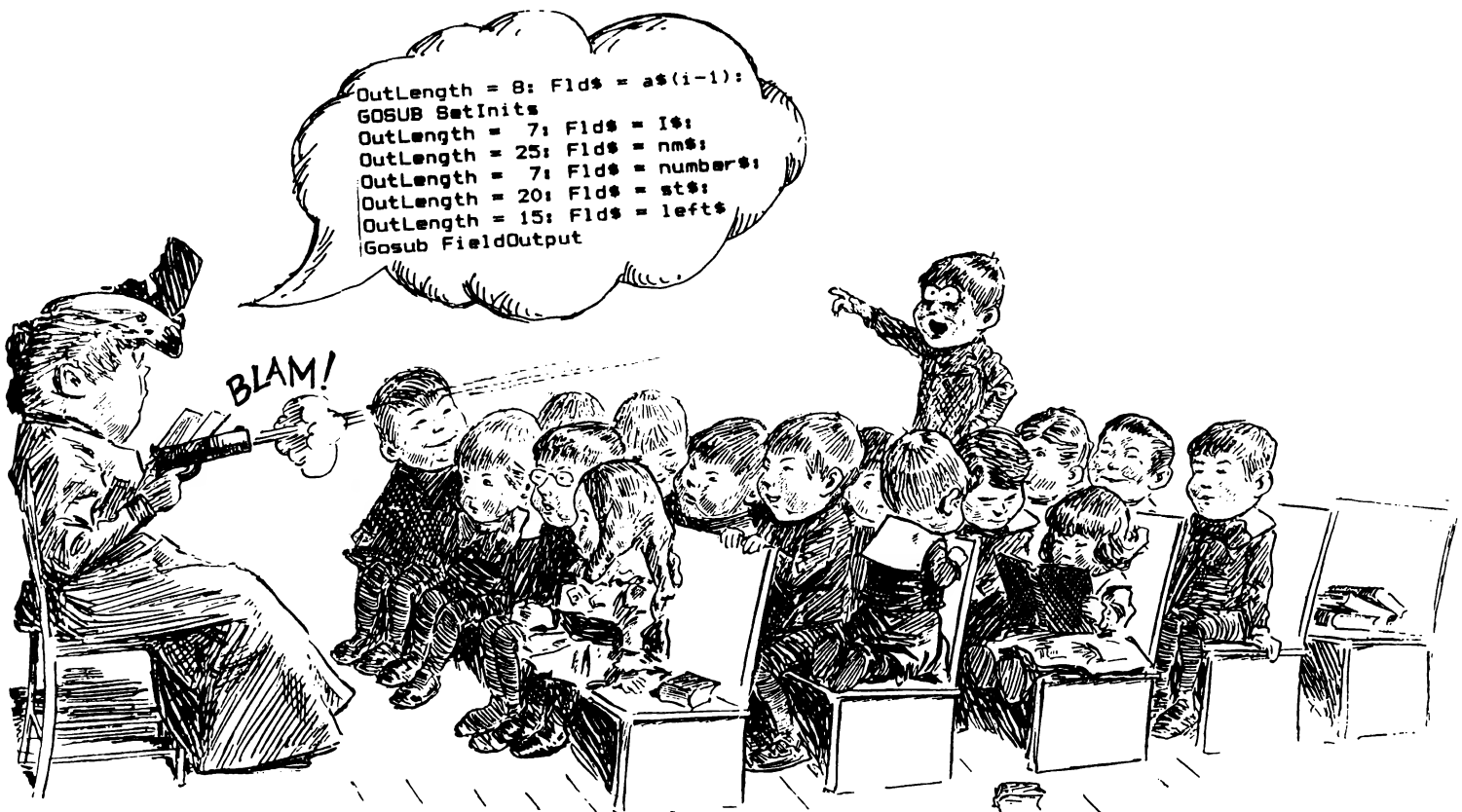
Instruction Set

PCs in Marketing..... 112

Plunge into the misty depths of 'soft' crystal balls — spreadsheets, budgeting programs and financial modelling languages. Les guides us through the murky depths of cost and profit centres in part three of his tutorial series.

Structured Programming..... 118

Why do today what you can put off until tomorrow? In this eminently sensible instalment of his series on structured programming, Phil Grouse drives us all to the next level of abstraction, tells us where we can put our files and shows how the leap-before-you-lookers can reattach themselves.



PERSONAL COMPUTERS IN MARKETING — PART 3

Budgeting — the very word is enough to make business people of all categories, creeds and companies cringe. In this month's tutorial Les looks at how computers can help make quicker, more accurate forecasts — it's not just for the marketing fraternity.

BUDGETING IS an essential activity for all business enterprises, as well as a major component of planning activity. The basic purpose of budgeting is to establish control over a business unit's activities by comparing the aims of a business plan with the actions needed to carry them out.

Budgets provide goals and divide an organisation into different areas, so responsibility for different parts of the business plan can be allocated.

This division of responsibility requires the identification of areas, such as cost and profit centres, throughout an organisation. Cost centres are areas like the EDP department, which are net consumers of funds, while profit centres are revenue generators, such as sales and marketing.

The Bottom Line

In this view of budgeting, performance is measured by the ability to meet or exceed profit budgets, or the ability to contain costs at or below the cost budgets. However, this view is simplistic: it doesn't account for the investment required to attain a result. For example, it might be simple for the factory to reduce costs by installing a new plant (which will allow it to meet budget as a cost centre), but the cost of the new plant would severely affect profitability.

For this reason, most responsibility centres are viewed as return on investment centres. To put it crudely, there's no point investing in a plant which returns only eight or 10 per cent on the investment; you'd be better off leaving the money in the bank.

Some analysts take this concept one stage further by deducting the cost of the investment from the centre and working on the residual income.

To the marketer, the most important budgets are those which view products as profit centres, allowing comparison between actual performance and forecasts, as well as comparison between existing products and new product opportunities or changes in existing product, distribution channels and so on. We'll look at some techniques in detail next month, but in the meantime I want to look at some ways budgets and planning models can be constructed on personal computers.

A Small Budgeting Program in BASIC

Several approaches to personal computer budgeting are possible, but they basically break up into pre-programmed models and spreadsheet programs which can be adapted more easily. For those readers who don't have access to a spreadsheet program (though there can't be many of you), I've included a BASIC program which constitutes a small, quite general, pre-programmed model.

The program is written in a subset of Microsoft BASIC, which should run without modification on most machines, though users of IBM PC BASIC or GW-BASIC may find the file handling has to be altered slightly (only the Open statements will require modification).

The model is for a manufacturing company with several products, each selling at different volumes with differing growth rates. Costs are split into variable costs (those which vary with sales volume, such as component or ingredient costs) and fixed costs (generally overheads, contribution to costs of buildings and the like).

The model also includes a straight-line depreciation component and calculation of company tax at 46 per cent. Various

enhancements are possible, and should be easy: changing growth from a constant percentage to some other basis such as exponential or power curve, calculating depreciation on some other basis or incorporating price breaks on some of the variable costs.

Because the model is written in a general-purpose programming language, it's possible to perform some functions which simply aren't possible on spreadsheets, although some modern spreadsheets have closed the gap quite considerably. In particular, producing graphs from a programmed model's output is not always easy, despite the fact that general-purpose graphics packages are available.

Spreadsheet Packages

Where more flexibility and simplicity are required, a spreadsheet program is far preferable. Spreadsheets first appeared on personal computers in 1979, when Visicalc was released for the Apple.

A spreadsheet basically emulates a large sheet of paper. However, where a financial analysis sheet only shows the results of the calculations, a spreadsheet contains the formulae representing the calculations. The program has the ability to re-calculate these formulae automatically and display the results. Any assumptions can therefore be changed and the results immediately displayed and printed.

Spreadsheets have been considerably enhanced since the early days of Visicalc, particularly with the move to more powerful 16-bit personal computers which have more memory. An early competitor to Visicalc, called Supercalc, is widely available, and the latest version, Supercalc 3, combines powerful spreadsheet calculation ►

Listing 1. Financial Analysis Program in BASIC

```

100 REM *** FINANCIAL ANALYSIS PROGRAM ***
110 REM *** WRITTEN IN MICROSOFT BASIC V5.2 ***
120 REM *** BY LES BELL, 3/16/82 ***
130 :
140 REM CALCULATES SIMPLE PROFIT AND LOSS STATEMENT FOR
150 REM VARIABLE NUMBER OF PRODUCTS AND VARIABLE MIX OF
160 REM FIXED AND VARIABLE COSTS. STORES INPUT DATA IN A
170 REM DISK FILE FOR LATER EDITING AND RE-RUN. OUTPUTS
180 REM RESULTS TO SCREEN OR DISK FILE.
190 :
200 REM *** INITIALISE ARRAY VARIABLES ***
210 PRINT CHR$(26):PRINT "Financial Analysis Program":PRINT:PRINT
220 INPUT "FRESH CASE OR READ FILE DATA (F OR R)":QS
230 IF QS="R" OR QS="r" THEN 1130
240 INPUT "Name for Model":TS
250 INPUT "HOW MANY TIME PERIODS":T
260 INPUT "HOW MANY PRODUCTS":P
270 INPUT "NUMBER OF FIXED COSTS PER PRODUCT":FC
280 INPUT "NUMBER OF VARIABLE COSTS PER PRODUCT":VC
290 REM *** INITIALISE ARRAY VARIABLES ***
300 REM PNS - PRODUCT NAME      PR - PRICE
310 REM GR - GROWTH RATE        SA - SALES VOLUME
320 REM RE - REVENUE            NIB - PROFIT CONTRIBUTION
330 REM TIBT - TIBT            TI - TAXABLE INCOME
340 REM T - TAX                 NI - NETT INCOME AFTER TAX
350 REM CF - FIXED COST         CV - VARIABLE COST
360 REM CVU - UNIT COST         SCF - TOTAL FIXED COSTS
370 REM SCV - TOTAL VARIABLE COST
380 DIM PNS(P),PR(P),GR(P),SA(P,T),RE(P,T),NIB(P,T),TIBT(T),TI(T),NI(T)
390 DIM CF(P,FC),CV(P,VC,T),CVU(P,VC),SCF(P,SCV(P,T))
400 :
410 REM *** GET NAMES OF COST ITEMS ***
420 PRINT CHR$(26)
430 PRINT:FOR I1=1 TO FC
440   PRINT "Name of Fixed Cost":I1:INPUT CFS(I1)
450 NEXT I1
460 PRINT:FOR I1=1 TO VC
470   PRINT "Name of Variable Cost":I1:INPUT CVS(I1)
480 NEXT I1
490 :
500 REM *** GET PRODUCT REVENUE AND COST DATA ***
510 PRINT CHR$(26)
520 FOR I1=1 TO P
530   PRINT CHR$(26)
540   PRINT "Name of Product":I1:INPUT PNS(I1)
550   PRINT "Unit Price of a "PNS(I1)":INPUT PR(I1)
560   PRINT "Initial sales volume of "PNS(I1)":INPUT SA(I1,1)
570   PRINT:PRINT "Growth Rate per period (%)":INPUT G
580   GR(I1) = 1 + G/100
590   PRINT:FOR I2=1 TO FC
600     PRINT "Fixed cost: "CFS(I2):INPUT CF(I1,I2)
610   NEXT I2
620   PRINT:FOR I2=1 TO VC
630     PRINT "Variable cost per unit: "CVS(I2):INPUT CVU(I1,I2)
640   NEXT I2
650   INPUT "OK - (Y/N)":QS:IF QS<>"Y" AND QS<>"y" AND QS<>"N" THEN 530
660 NEXT I1
670 :
680 REM *** DEPRECIATION ENTRY ROUTINE ***
690 PRINT CHR$(26)
700 INPUT "Number of depreciable assets":D
710 DIM D(D),TD(T),ASST$(D),LIFE(D),RBV(D),SAL(I1)
720 FOR I1=1 TO D
730   PRINT CHR$(26)
740   PRINT "Name of depreciable asset":I1:INPUT ASST$(I1)
750   PRINT "Remaining Book Value of asset":I1:INPUT RBV(I1)
760   PRINT "Remaining life of asset":I1:INPUT LIFE(I1)
770   PRINT "Salvage Value of asset":I1:INPUT SAL(I1)
780 NEXT I1
790 :
800 REM *** FILE WRITE ROUTINE ***
810 PRINT CHR$(26):INPUT "Write to file":QS
820 IF QS<>"Y" AND QS<>"y" THEN 1410
830 PRINT:INPUT "Name of file":NS
840 OPEN "O",NS
850 WRITE#1,"Name is",TS,"No of periods:",T,"No of products:",P
860 WRITE#1,"No of fixed costs:",FC,"No of variable costs:",VC
870 WRITE#1,"No of depreciable assets:",D
880 FOR I3=1 TO FC
890   WRITE#1,"Fixed cost:",I3,CFS(I3)
900 NEXT I3
910 FOR I3=1 TO VC
920   WRITE#1,"Variable cost:",I3,CVS(I3)
930 NEXT I3
940 FOR I1=1 TO P
950   WRITE#1,"Product name:",PNS(I1),"Growth rate:",GR(I1)
960   WRITE#1,"Product price:",PR(I1),"Initial sales:",SA(I1,1)
970   FOR I3=1 TO FC
980     WRITE#1,"Fixed cost:",I3,CF(I1,I3)
990   NEXT I3
1000   FOR I3=1 TO VC
1010     WRITE#1,"Variable cost:",I3,CVU(I1,I3)
1020   NEXT I3
1030 NEXT I1
1040 FOR I3=1 TO D
1050   WRITE#1,"Name of asset:",ASST$(I3)
1060   WRITE#1,"RBV:",RBV(I3),"Life:",LIFE(I3)
1070   WRITE#1,"Salvage:",SAL(I3)
1080 NEXT I3
1090 CLOSE 1
1100 GOTO 1410
1110 :
1120 REM *** FILE READ ROUTINE ***
1130 PRINT CHR$(12)
1140 INPUT "Name of file to read":NS
1150 OPEN "I",NS
1160 INPUT#1,DMYS,TS
1170 PRINT:PRINT TS:PRINT:INPUT "OK (Y/N)":QS
1180 IF QS<>"Y" AND QS<>"y" AND QS<>"N" THEN CLOSE 1:GOTO 210
1190 INPUT#1,DMYS,T,DMYS,P,DMYS,FC,DMYS,VC,DMYS,D
1200 FOR I3=1 TO FC
1210   INPUT#1,DMYS,DMYS,CFS(I3)
1220 NEXT I3
1230 FOR I3=1 TO VC
1240   INPUT#1,DMYS,DMYS,CVS(I3)
1250 NEXT I3
1260 FOR I1=1 TO P
1270   INPUT#1,DMYS,PNS(I1),DMYS,GR(I1),DMYS,PR(I1),DMYS,SA(I1,1)
1280   FOR I3=1 TO FC
1290     INPUT#1,DMYS,DMYS,CF(I1,I3)
1300   NEXT I3
1310   FOR I3=1 TO VC
1320     INPUT#1,DMYS,DMYS,CVU(I1,I3)
1330   NEXT I3
1340 NEXT I1
1350 FOR I3=1 TO D
1360   INPUT#1,DMYS,ASST$(I3),DMYS,RBV(I3),DMYS,LIFE(I3),DMYS,SAL(I1)
1370 NEXT I3
1380 CLOSE 1
1390 :
1400 REM *** CALCULATE SALES AND REVENUE FIGURES ***
1410 PRINT CHR$(26):
1420 FOR I1=1 TO P
1430   RE(I1,1)=SA(I1,1) * PR(I1)
1440   FOR I2=2 TO T
1450     SA(I1,I2) = SA(I1,I2-1) * GR(I1)
1460     RE(I1,I2) = SA(I1,I2) * PR(I1)
1470   NEXT I2
1480 NEXT I1
1490 :
1500 REM *** CALCULATE FIXED COSTS ***
1510 FOR I1=1 TO P
1520   SCF(I1)=0
1530   FOR I3=1 TO FC
1540     SCF(I1)=SCF(I1)+CF(I1,I3)
1550   NEXT I3
1560 NEXT I1
1570 :
1580 REM *** CALCULATE VARIABLE COSTS ***
1590 FOR I1=1 TO P
1600   FOR I3=1 TO VC
1610     FOR I2=1 TO T
1620       CV(I1,I3,I2) = CVU(I1,I3) * SA(I1,I2)
1630     NEXT I2
1640   NEXT I3
1650 NEXT I1
1660 FOR I1=1 TO P
1670   FOR I2=1 TO T
1680     SCV(I1,I2)=0
1690     FOR I3=1 TO VC
1700       SCV(I1,I2)=SCV(I1,I2) + CV(I1,I3,I2)
1710     NEXT I3
1720   NEXT I2
1730 :
1740 NEXT I1
1750 REM *** CALCULATE NET INCOME BEFORE TAX ***
1760 FOR I1=1 TO P
1770   FOR I2=1 TO T

```

PCS IN MARKETING

capabilities with graphics and the ability to manipulate data such as dates.

However, the market leader is a product called Lotus 1-2-3, which has blazed a trail by demonstrating that ease of use is not necessarily incompatible with a full set of powerful features. The 1-2-3 spreadsheet offers a full range of arithmetic, scientific and financial functions (net present value, internal rate of return, and so on), as well as allowing the user to graph data and print it on a wide range of printers and

plotters.

The major objection to such spreadsheet programs is that their operation is hidden beneath the surface, and the user sees only the results and not the formulae which give rise to them. This becomes much more dangerous when an internal consultant, for example, develops a model and then hands it to a user without adequate documentation of its internal operation and, most importantly, the assumptions it makes. Models constructed in

programming languages can be documented within the program, but spreadsheets are difficult to document internally, particularly if presentation-quality results are required.

Even in the simplest spreadsheets, it is bad practice to embed assumptions, such as growth rates, discount rates and so on, inside formulas. It is better to place magic numbers in a cell by themselves, perhaps in an 'assumptions' section of the sheet, and labelled so that they can be easily

```

1780 NIB(I1,I2) = RE(I1,I2) - SCP(I1) - SCV(I1,I2)
1790 NEXT I2,I1
1800 :
1810 REM *** CALCULATE DEPRECIATION ***
1820 FOR I1=1 TO D:FOR I2 = 1 TO T:D(I1,I2)=0:NEXT I2,I1
1830 FOR I1 = 1 TO D
1840 IF LIFE(I1) < T THEN LIM = LIFE(I1) ELSE LIM = T
1850 FOR I2 = 1 TO LIM
1860 D(I1,I2) = (RBV(I1)-SAL(I1))/LIFE(I1)
1870 NEXT I2
1880 NEXT I1
1890 :
1900 REM *** CALCULATE TOTAL DEPRECIATION ***
1910 FOR I2 = 1 TO T
1920 TD(I2)=0
1930 FOR I1 = 1 TO D
1940 TD(I2) = TD(I2) + D(I1,I2)
1950 NEXT I1
1960 NEXT I2
1970 :
1980 REM *** TOTAL INCOME CALCULATION ***
1990 FOR I2=1 TO T
2000 TIBT(I2)=0
2010 FOR I1=1 TO P
2020 TIBT(I2)=TIBT(I2)+NIB(I1,I2)
2030 NEXT I1
2040 NEXT I2
2050 :
2060 REM *** TAXABLE INCOME CALCULATION ***
2070 FOR I2=1 TO T:TI(I2)=0:NEXT I2
2080 FOR I2=1 TO T
2090 TI(I2)=TIBT(I2) - TD(I2)
2100 NEXT I2
2110 :
2120 REM *** TAX CALCULATION ***
2130 FOR I2=1 TO T
2140 TI(I2)=TI(I2)*.46
2150 IF TI(I2) < 0 THEN TI(I2) = 0
2160 NEXT I2
2170 :
2180 REM *** NIAT CALCULATION ***
2190 FOR I2 = 1 TO T
2200 NI(I2) = TIBT(I2) - TI(I2)
2210 NEXT I2
2220 :
2230 REM *** SELECT OUTPUT DEVICE ***
2240 INPUT "Calculations done. Print to Screen (S) or Disk (D):"AS
2250 IF AS = "D" OR AS = "d" THEN 2730
2260 :
2270 AS = "S*****.##"
2280 BS = "*****.###"
2290 REM PRINT SALES AND REVENUE FIGURES
2300 FOR I1=1 TO P:PRINT
2310 PRINT "Product":I1;"- ":"PNS(I1),"Growth rate - ":"GR(I1)
2320 PRINT "Price":":FOR I2=1 TO T:PRINT USING AS; PR(I1);NEXT I2:PRINT
2330 PRINT "Volume":":FOR I2=1 TO T:PRINT USING BS; SA(I1,I2);NEXT I2:PRINT
2340 PRINT "Revenue":":FOR I2=1 TO T:PRINT USING AS;RE(I1,I2);NEXT I2:PRINT
2350 PRINT
2360 REM *** PRINT COSTS ROUTINE ***
2370 PRINT "Fixed Costs:"
2380 FOR I3 = 1 TO FC
2390 PRINT CFS(I3);:FOR I2=1 TO T:PRINT USING AS; CF(I1,I3);NEXT I2:PRINT
2400 NEXT I3
2410 PRINT "Total":":FOR I2 = 1 TO T:PRINT USING AS; SCP(I1);NEXT I2:PRINT
2420 PRINT
2430 PRINT "Variable Costs:"
2440 FOR I3 = 1 TO VC
2450 PRINT CVS(I3);:FOR I2 = 1 TO T:PRINT USING AS; CV(I1,I3,I2);NEXT I2:PRINT
2460 NEXT I3
2470 PRINT "Total":":FOR I2 = 1 TO T:PRINT USING AS; SCV(I1,I2);NEXT I2:PRINT
2480 PRINT
2490 REM *** PRINT PROFIT CONTRIBUTION ***
2500 PRINT "PTPC":":FOR I2 = 1 TO T:PRINT USING AS; NIB(I1,I2);NEXT I2:PRINT
2510 NEXT I1
2520 PRINT
2530 REM *** TOTAL INCOME PRINT SECTION ***
2540 PRINT "TIBT":":FOR I2 = 1 TO T:PRINT USING AS;TIBT(I2);NEXT I2:PRINT
2550 PRINT
2560 REM *** DEPRECIATION PRINT SECTION ***
2570 PRINT "Depreciation:"
2580 FOR I1 = 1 TO D
2590 PRINT ASSTS(I1),"RBV - $":RBV(I1);" SAL - $":SAL(I1);" Life - ":"LIFE(I1)
2600 PRINT "Deduction":":FOR I2 = 1 TO T:PRINT USING AS; D(I1,I2);NEXT I2:PRINT
2610 NEXT I1
2620 PRINT "Total Dep.":":FOR I2 = 1 TO T:PRINT USING AS;TD(I2);NEXT I2:PRINT
2630 PRINT
2640 REM *** TAXABLE INCOME PRINT SECTION ***
2650 PRINT "Taxable Inc.":":FOR I2 = 1 TO T:PRINT USING AS;TI(I2);NEXT I2:PRINT
2660 PRINT
2670 REM *** TAX PAYABLE PRINT SECTION ***
2680 PRINT "Tax Payable":":FOR I2 = 1 TO T:PRINT USING AS;TI(I2);NEXT I2:PRINT
2690 :
2700 REM *** NIAT PRINT SECTION ***
2710 PRINT "NIAT":":FOR I2 = 1 TO T:PRINT USING AS;NI(I2);NEXT I2:PRINT
2720 END
2730 INPUT "Name of file to print to:"QS
2740 OPEN "O".1,QS
2750 AS = "S*****.##"
2760 BS = "*****.###"
2770 REM PRINT SALES AND REVENUE FIGURES
2780 FOR I1=1 TO P:PRINT#1," "
2790 PRINT#1,"Product":I1;"- ":"PNS(I1),"Growth rate - ":"GR(I1)
2800 PRINT#1,"Price":":FOR I2=1 TO T:PRINT#1, USING AS; PR(I1);NEXT I2:PRINT#1," "
2810 PRINT#1,"Volume":":FOR I2=1 TO T:PRINT#1, USING BS; SA(I1,I2);NEXT I2:PRINT#1," "
2820 PRINT#1,"Revenue":":FOR I2=1 TO T:PRINT#1, USING AS;RE(I1,I2);NEXT I2:PRINT#1," "
2830 PRINT#1," "
2840 REM *** PRINT COSTS ROUTINE ***
2850 PRINT#1,"Fixed Costs:"
2860 FOR I3 = 1 TO FC
2870 PRINT#1, CFS(I3);:FOR I2=1 TO T:PRINT#1, USING AS; CF(I1,I3);NEXT I2:PRINT#1," "
2880 NEXT I3
2890 PRINT#1,"Total":":FOR I2 = 1 TO T:PRINT#1, USING AS; SCP(I1);NEXT I2:PRINT#1," "
2900 PRINT#1," "
2910 PRINT#1,"Variable Costs:"
2920 FOR I3 = 1 TO VC
2930 PRINT#1, CVS(I3);:FOR I2 = 1 TO T:PRINT#1, USING AS; CV(I1,I3,I2);NEXT I2:PRINT#1," "
2940 NEXT I3
2950 PRINT#1,"Total":":FOR I2 = 1 TO T:PRINT#1, USING AS; SCV(I1,I2);NEXT I2:PRINT#1," "
2960 PRINT#1," "
2970 REM *** PRINT PROFIT CONTRIBUTION ***
2980 PRINT#1, "PTPC":":FOR I2 = 1 TO T:PRINT#1, USING AS; NIB(I1,I2);NEXT I2:PRINT#1," "
2990 NEXT I1
3000 PRINT#1," "
3010 REM *** TOTAL INCOME PRINT SECTION ***
3020 PRINT#1, "TIBT":":FOR I2 = 1 TO T:PRINT#1, USING AS;TIBT(I2);NEXT I2:PRINT#1," "
3030 PRINT#1," "
3040 REM *** DEPRECIATION PRINT SECTION ***
3050 PRINT#1, "Depreciation:"
3060 FOR I1 = 1 TO D
3070 PRINT#1, ASSTS(I1),"RBV - $":RBV(I1);" SAL - $":SAL(I1);" Life - ":"LIFE(I1)
3080 PRINT#1, "Deduction":":FOR I2 = 1 TO T:PRINT#1, USING AS; D(I1,I2);NEXT I2:PRINT#1," "
3090 NEXT I1
3100 PRINT#1, "Total Dep.":":FOR I2 = 1 TO T:PRINT#1, USING AS;TD(I2);NEXT I2:PRINT#1," "
3110 PRINT#1," "
3120 REM *** TAXABLE INCOME PRINT SECTION ***
3130 PRINT#1, "Taxable Inc.":":FOR I2 = 1 TO T:PRINT#1, USING AS;TI(I2);NEXT I2:PRINT#1," "
3140 PRINT#1," "
3150 REM *** TAX PAYABLE PRINT SECTION ***
3160 PRINT#1, "Tax Payable":":FOR I2 = 1 TO T:PRINT#1, USING AS;TI(I2);NEXT I2:PRINT#1," "
3170 :
3180 REM *** NIAT PRINT SECTION ***
3190 PRINT#1, "NIAT":":FOR I2 = 1 TO T:PRINT#1, USING AS;NI(I2);NEXT I2:PRINT#1," "
3200 CLOSE 1
3210 END

```




Be healthier! Live longer!

*With the help of
Prevention Magazine...*

Each month...

ideas, tips, and medically based advice to help improve and maintain the good health of you and your family.

Each month...

PREVENTION Magazine is packed with articles, reports, and regular features... about topics that could affect your health –

- ☆ Women's health ☆ Men's health ☆ Family health
- ☆ Infant care ☆ Health through exercise
- ☆ Health through food ☆ Natural healing
- ☆ Vitamins ☆ Dental care ☆ Beauty network
- ☆ Product watch ☆ Health books review
- ☆ Health for pets...and more!



*Good
health in a
nutshell!*

**Add Prevention Magazine
to your regular reading –
it could help you be healthier,
live longer...there's nothing
more important, is there?**

**Subscribe now and
SAVE \$3**

Offer valid within Australia until 30/12/85.
Please allow up to three weeks for delivery
of your first issue.

Yes! Please send me twelve monthly issues of Prevention Magazine at the special introductory price of only \$15.00 instead of the usual \$18.00 (the first two issues are free).

MR/MRS/MISS _____

ADDRESS _____

POSTCODE _____

☐ I enclose payment cheque/money order payable to The Federal Publishing Company Pty. Ltd. Mail to Freepost No. 4, The Federal Publishing Company, P.O. Box 227, Waterloo NSW 2017. No stamp is required if posted in Australia.

☐ Charge to my ☐ Bankcard ☐ Mastercard ☐ American Express

CARD No. _____

Expiry Date / / Signature _____

Automatic Ice Co. Direct Connect Modem For Apple IIe.

★ Super Intelligent direct connect modem for Apple II & IIe fully contained on a single card — plugs into slot #2 — (does not require separate serial card or external line isolation device).

★ 300 Baud full duplex or 1200/75 and 75/1200 with automatic line turnaround. Provision for expansion to **CCITT Type V22 operation (1200 Baud full duplex) and V26 (2400 Baud half duplex) with a piggyback expansion board available early 1985.**

★ A full monochrome version of Prestel Videotext is implemented in EPROM as well as a limited colour version within the Apple colour display capabilities. A separate Videotext display card with the full colours and features of Prestel as well as an extended high resolution format will be available early 1985. A single keystroke entry immediately turns the Apple into a Prestel Terminal as required by the Telecom Viatel system coming on line in 1985. The modem can operate as a full editing and composing terminal to generate and transmit pictures as an information provider as well as receiving pictures, saving or retrieving to disc and operating under a user-written program, making intelligent decisions on pictures received or sending pictures from memory or disc. Pictures can be dumped to a printer and the **Apple Scribe printer will dump colour pictures.** The firmware transmits the user ID automatically from the battery backed CMOS Ram and the ID can be remotely programmed as required by Viatel. Prestel dialling is also automatically done from phone numbers stored in the CMOS Ram.

★ **A complete comprehensive communications program** contained in EPROM allows easy and immediate transmission and reception of Binary files, Text files and Basic programs to memory or disc — **No other communications software is required.** All modem firmware is bankswitched into the \$C200 space and does not interfere with other program memory or disc.

★ Asynchronous or synchronous operation. Supports Bisynch, HDLC, SDLC & X25 at the link level. Flag generation, CRC error code generation & checking are all done by hardware. All registers and operating parameters are fully software programmable.

★ **Auto Answer — Auto dial.** Senses true dial tone, ring tone, busy tone and acts intelligently, returning status messages. Automatically selects pulse or DTMF (tone) dialling.

★ Can emulate Hayes Micromodem, Hayes Smartmodem, Apple serial card and Prestel terminal as well as its own modes. Conforms to the published "Firmware" standard for Apple peripheral cards and is compatible with Basic, Pascal, C/PM and machine language programs which obey the Apple standard. A fully transparent mode is available.

★ 2Kx8 battery powered CMOS RAM stores default parameters, phone numbers and log-on strings, allowing **single keystroke call establishment.** The full telephone list can be displayed from a program or the keyboard with logons/passwords selectively not visible. A further keyboard or program input can establish the link automatically and return a status message.

★ The Firmware is contained in a 64K EPROM. There is provision for an additional 64K for future expansion or special user-written routines.

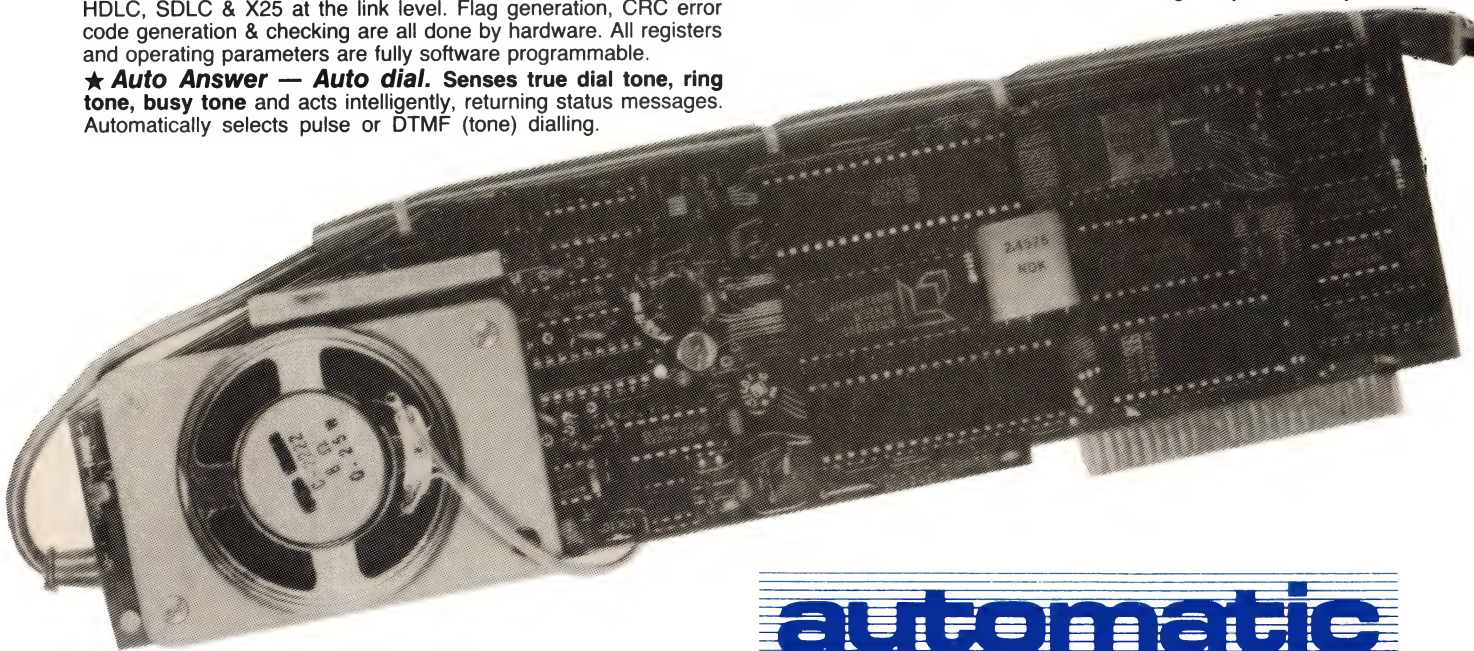
★ **Onboard battery backed calendar clock** can time and initiate calls or keep an activity log. The clock is ProDos compatible and is automatically recognised. It is also accessible for other uses.

★ Optional standard telephone connection on the modem allows easy installation into existing phone plug. When the modem is not engaged the telephone acts in the normal manner.

★ Has socket for installation of DES data cypher chip for security, identification & EFT applications. *Permission is required from the American State Dept. for purchase of cypher chip.*

★ The modem contains three very sophisticated software programmable integrated circuits connected to all aspects of the hardware and a large amount of unused EPROM space. It is envisaged that additional features will be added to the firmware in future. The documentation is presently limited but the full operation of the hardware and firmware will eventually be documented.

★ **A mini word processor** in EPROM allows pre-composition of memos which can then be sent with a single keystroke entry.



Recommended Retail Price **\$395.00**
including sales tax.

**automatic
ice
company**

10 Smith Street, Charlestown. 2290. N.S.W.
Tel: (049) 63 3188

identified and changed. However, identifying assumptions is difficult, particularly as many are subtle and easy to overlook (I did it myself in my BASIC program, by assuming company tax at 46 per cent!).

Already in Australia, at least one major corporate takeover has been bungled because of an undocumented assumption in a spreadsheet, with a resulting loss in the millions of dollars.

Somewhere between pre-programmed models and spreadsheet programs are specialised financial modelling languages which run on mainframes and minicomputers as well as personal computers. Programs such as SAS, Focus and IFPS are well suited to the creation of large models, offering advanced features such as sensitivity analysis, iterative solutions and goal-seeking which are beyond most spreadsheets.

Spreadsheets offer many advantages over manual methods. The most obvious is that they completely remove the need for any tedious number-crunching with a cal-

culator, and this can be reduced to a few hours with a PC. Since budgeting is faster and easier, we can reduce the budgeting cycle from annual to quarterly in many industries, and can also find time to better analyse trends and seasonal variations.

Spreadsheets are more accurate than hand calculations. They also offer the much-vaunted ability to perform 'what-if?' analysis, such as 'what if we increase the price by a dollar and unit sales drop by 20,000?', or 'what if we use new packaging which improves sales by 5 per cent, but costs 10 per cent more?'.

It is also easier to update budgets in the light of experience. Some people tend to view a completed budget as engraved in granite, and refuse to revise it even though actual results indicate it to be increasingly meaningless. With a spreadsheet model, revisions take only a few minutes, and are easy to communicate to management in graph form.

Spreadsheets have their disadvantages too, although I feel many of these can be

avoided with some awareness and care. Firstly, many budget or forecast models tend to lose touch with reality. For example, we assume a constant increase in sales of 10 per cent per quarter, rather than using our experience of seasonal variations to adjust the sales accordingly, simply because it makes the spreadsheet easier to manage.

Oversimplifications like these are common, and they tend to multiply throughout a model, so that the aggregation of incorrect assumptions renders the result to be more of a wish-fulfilment than a realistic budget. There is also a tendency to reach for a spreadsheet for many problems which are better solved through experience.

References

Sweeney, Allen and John Wisner Jr, *Budgeting Fundamentals for Nonfinancial Executives and Managers*, McGraw-Hill, New York, 1977. □



Get into gear with overlander

Can you tell the difference between an independent front end and a shot shock? Do you know an ARGO from a G-Wagen? Are you aware of seasonal road conditions on the Canning Stock Route?

OVERLANDER has the answers to these and hundreds of other questions about one of Australia's fastest growing leisure pursuits — four-wheel driving.

Each new 4WD vehicle released is treated to a comprehensive report, and usually a full road test, by some of Australia's top motoring writers.

Our excellent technical features, too, have earned **OVERLANDER** its reputation as the definitive voice on off-roading in Australia. Each month we cover several areas of significance to 4WD owners — suspension, differentials, wheels and tyres, CB radios and much more.

If you own a four-wheel drive, are contemplating buying one or are just interested in this exciting area . . . get into your newsagent now and get into gear with **OVERLANDER**.

Don't go bush without it!

HOW TO WRITE A STRUCTURED PROGRAM — Part Seven

WE HAVE NOW almost reached the end of our first 'meaningful' structured program example. As promised in the last article, we now tackle the final module **PutFile**. The function of this module is to write out the appropriately formatted name and address record to file #2 (the user's output file).

The PutFile Module

On calling this module certain variables have been established. These are:

- i**: the title index (in the range 2 to 10).
- nm\$**: the name of the recipient (with initials).
- number\$**: the house number.
- st\$**: the street name.
- sub\$**: the suburb and postcode.

Each of these fields must now be written to file #2 with a fixed record layout, as shown in Table 1.

Before launching into the logic of **PutFile**, here are a few points about using formatted output with BASIC.

Many BASIC dialects support a 'print using' statement; the IBM Advanced BASIC is no exception. The only problem is that there's not much agreement between the various BASICs about how the statement works. Each implementor seems to do his or her own thing. Fortunately, we don't need to get bogged down with too much detail here, since all we want to do is output a string left-justified in a field of predetermined width. Here's how we do it with Advanced BASIC. The statement:

PRINT #2, using " ";something\$ will output the contents of the string **something\$** to file #2. It will be left-justified in a field of width determined by the 'format' string specified after the keyword 'using'. In this case, the format string says the field is four characters wide. The format string itself is four characters long. It consists of spaces with a " at the beginning and end. These " characters (some folk call them 'sloshes' to distinguish them from '/' — the 'slash') are included in the field width count.

Because we'll be using variations on this statement to output the various fields, we'll use another subroutine to do the

Contents	Characters
Title	8
Initials	7
Surname	25
House Number	7
Street Name	20
Suburb	15
Postcode	4
Filler	1

Table 1.

work for us. However, that subroutine will need to know (a) what has to be output, and (b) how many characters are to be output. These are the 'parameters' which we must 'pass' to the subroutine. In more civilised languages, the syntax allows for the GOSUB (or 'call') to be followed by a bracketed list of parameters. In poor old BASIC, we must decide on some suitable (global) variable names, then set them up before calling the subroutine. We will use **OutLength** to specify the field width, and **Fld\$** to contain the string to be output. (BASIC objects to **Field\$** as an identifier). The subroutine which does the deed will be **FieldOutput**.

The design for **PutFile** then becomes quite simple. The toughest part will be splitting out the initials and surname from **nm\$**. But that's not too bad, since we decided earlier to insist on all initials being crammed up together with a space preceding the surname. Thus, we can hunt for the space within **nm\$**, using its position to mark the break between initials and surname. This task will be relegated to the module **SetInits**, which uses **nm\$** to set the initials (complete with intervening spaces) into **i\$**, and the surname into **nm\$**.

The fields must be output in the correct sequence, so we begin with the eight-character title from **a\$(i-1)**. You will recall that **i** is now one greater than the index needed for the title array **a\$**. Accordingly, the following set of statements will do the trick:

```
OutLength = 8: Fld$ = a$(i-1): GOSUB
FieldOutput
```

This is the first line in the **PutFile** flow-

block in Figure 1. Getting the GOSUB at the end of the line might be a bit tricky — at least it is with the current version of Speedit. One normally uses the F8 key to create the GOSUB call; however, this insists the GOSUB starts at the leftmost column of the current block. To pop the GOSUB at the end of a string of other statements, as shown above, you simply position the cursor at the end of those statements, then delete the terminating carriage return with a Control G (as per Wordstar). The GOSUB statement will then be pulled back to the end of the line.

Be careful never to follow a GOSUB statement with another statement on the same line. This is because the translator always puts a comment after the GOSUB in the source code, and that comment would obscure the remaining code.

Next in Line

The second line in **PutFile** calls the **SetInits** module. As explained above, this module sets up the initials field in **i\$** and the surname in **nm\$**. We will examine how this is done below. For the time being we follow the 'structured programming' practice of deferring the problem for later solution. More properly, this is known as 'deferring to the next level of abstraction'. Whatever you call it, it amounts to putting off for later what you can't handle now.

This is a perennial problem for programmers. It's so rewarding to develop some really obscure and complex piece of coding — especially if it works. There is therefore always the temptation to make modules needlessly complex. Pity the poor programmer whose job it is to rework that code at a later date — and pity the author when it turns out to harbour a sneaky gremlin. The rule is KISS — Keep It Simple, Stupid.

Now **i\$** and **nm\$** are set up, lines 3 and 4 of **PutFile** output these values using the **FieldOutput** module. Similarly, lines 5 and 6 deal with writing out the house number (from **number\$**) and the street name (from **st\$**).

The variable **sub\$** consists of the suburb name trailed by a space, then the four-character postcode. The expression in line 7:

left\$(sub\$,len(sub\$)-5)
is simply sub\$ with the last five characters chopped off; in other words, it's the sub-urb. This line therefore writes out the sub-urb field. We've put the GOSUB on the next line because the flowblock is getting a bit too wide.

The next two lines deal with the post-code, as this is in right\$(sub\$,4). Finally, we output a single blank to the output file (the filler byte).

Incidentally, this last line was done explicitly rather than by means of the **FieldOutput** module. You'll see why if you study the logic of that module (Figure 3).

The SetInits Module

Now take a look at **SetInits** in Figure 2.

Remember nm\$ holds the addressee's name. The initials have no separating spaces, and one space separates the initials from the surname which follows. Line 1 of this module locates that separating space, then adds 1 to it to mark the position of the start of the surname. If for some reason the name contains no space character, the INSTR function will return a zero, and the marker k would be 1.

This is tested in line 2. If true, the initials field I\$ is set to a single blank, and n\$ remains unaltered. This allows the odd surname without prefixed initials to pass unscathed. It also takes care of the case where nm\$ is empty.

Generally, it will be the ELSE branch which is executed. It begins by setting I\$ equal to a string of zero length (the 'null string'), then appending each of the k-2 initials plus a separating blank. Since each pass through the FOR loop adds two characters to I\$, the final length of I\$ will be 2(k-2). We get rid of the final trailing blank

Sometimes we realise a little late that part of the module we are currently creating should really have been handled by a separate subroutine. All is not lost.

from I\$ by taking the leftmost 2k-5 characters only.

Finally, the last line of SetInits replaces the contents of nm\$ with the surname string only. The expression mid\$(nm\$,k) is the string starting at position k of nm\$ and continuing to the end of the string. Remember we set k equal to the starting position of the surname in nm\$ in line 1.

The FieldOutput Module

Figure 3 shows the **FieldOutput** module.

This is really just a 'convenience' module; it saves us from repeatedly rewriting the same lines of code. It also reduces the chances of transcription error.

Abstraction and Attachment

The idea of 'abstraction' was introduced earlier in this article; in principle, it simply means the practice of relegating some of your code to another module. You then invoke (call with GOSUB) that module when you need it. This means when you decide to create such an abstracted module, you must also provide a definition. That definition must give sufficient detail to enable you to write the necessary code when you come to create that module; this

is why Speedit's F8 key asks you for both the name and short definition of the new module. The short definition appears on the bottom line of the screen while you're writing the new flowblock, and acts as a reminder of what the module has to do.

Sometimes we realise a little late that part of the module we are currently creating should really have been handled by a separate subroutine. All is not lost. Speedit provides two 'abstraction' commands. The Control-B (↑B) command will abstract a block, and the Control-P (↑P) command abstracts a pile. This means you can isolate either a single block or a group of blocks (a pile) and have them replaced by a single GOSUB reference. The replaced code will wind up elsewhere as a new module. Both these commands ask you for the name of the new module, as well as the short definition.

The reverse process is 'attachment'; it may be that you want to replace a single GOSUB reference with the lines of code from the called module. Speedit's Alt-A command does just that. It's there for those who need it, but if you organise your work with a degree of common sense you're not likely to use it.

A word of warning about attachment. If there are any other GOSUB references to the attached module, they will fall over during the translation stages. This is because the Alt-A command whips away the called module, placing it where the GOSUB statement was located. As a result there would be no module of that name in the program.

Finally, when using Alt-A the GOSUB reference must be on a single line of its own, otherwise Speedit will beep an error message. □

PutFile

```
OutLength = 8: Fld$ = a$(i-1): Gosub FieldOutput
GOSUB SetInits
OutLength = 7: Fld$ = I$: Gosub FieldOutput
OutLength = 25: Fld$ = nm$: Gosub FieldOutput
OutLength = 7: Fld$ = number$: Gosub FieldOutput
OutLength = 20: Fld$ = st$: Gosub FieldOutput
OutLength = 15: Fld$ = left$(sub$,len(sub$)-5)
Gosub FieldOutput
OutLength = 4: Fld$ = right$(sub$,4)
Gosub FieldOutput
print #2," ": 'The filler byte
```

SetInits

```
k=instr(nm$,"")+1 'Position of surname start
IF k=1
  rem No blank I$=""
  I$=" "
  FOR n = 1 to k-2
    I$=I$+mid$(nm$,n,1)+" "
  rem length of I$ is now 2k-4
  I$=left$(I$,2*k-5)
nm$ = mid$(nm$,k) :Rem Surname
```

FieldOutput

```
print #2,using "\"+space$(OutLength-2)+"\";Fld$;
```

Figure 1 (above). The PutFile module is responsible for sending the name and address information to the output file. Figure 2 (top right). SetInits sets up the initials field in I\$ and the surname in nm\$ from the data in nm\$. Figure 3. FieldOutput does a formatted write operation to file #2.

ATTENTION HARDWARE HACKERS

Computer Projects Vol. 1 should be addressed to your input port now.

ENTER THE FOLLOWING DATA

- A dozen projects to build!
- Mods to the '660 Learners' Micro.
- Mods for the Blue Label System 80.
- Intro to the STD buss.
- Modifying TVs for use as monitors.

ADD-ONS TO BUILD


Among the projects described, you can build a **direct-connect modem**, an **RS232 Breakout Box**, a **serial-parallel interface**, a **Microbee Proportional Joystick Controller** or a **Microbee MultiPROM interface**.

Or, if you want to start 'from scratch', you can build the **Little Big Board** complete Z80-based single-board computer featuring disk controller, two serial ports, STD buss and 64K RAM.

Only \$5.95

Please add \$1 to the cost of the magazine to cover postage and handling. (Add \$5 to these charges for air mail postage outside Australia.) Order your copy now from:

Federal Marketing
P.O. Box 227, Waterloo, N.S.W. 2017



Buying a computer?

Here's a magazine that's sure to help you!

We aim to provide you with the information you'll need to compare, evaluate — and make the right decision on which computer is right for you.

We've collected a wealth of articles, written by rank beginners as well as those deeply experienced in the computer industry. All of them have gone through the drama of buying a personal computer and they'll share their experiences with you.

Available at your newsagent now

only \$4.50

EMTEK PC/640

- 16 bit PC
- 640K RAM on-board
- 2 x 360K drives
- Printer & Serial ports on-board
- 130W supply
- 6 expansion slots
- Complete MANUALS
- MS-DOS 2.11 with hard disk support, printer spooler, RAM disk s/ware
- Monochrome display card



\$2499 including Sales Tax
excluding MONITOR
High Resolution TTL monitor \$233.60

MS-DOS is a registered trademark of Microsoft Corp.

O.P.E.N ACCESS



**It Reads, Writes and does Arithmetic.
It Paints in 3-D, Keeps Your Appointments
and Talks to the World.**

OPEN ACCESS includes an electronic spreadsheet, 3-D graphics, word processing, appointment scheduler and telecommunications module — all revolving around the powerful information manager. \$955 inc Sales Tax

THE
**EMTEK
PROFESSIONAL
PACKAGE**
= \$3299

including:

- Sales Tax
- EMTEK - PC/640
- High Resolution TTL MONITOR
- O.P.E.N. ACCESS

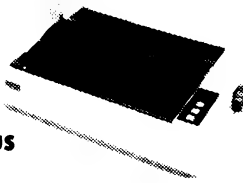
FREE!
2 HOURS
PROFESSIONAL
TRAINING

Sakata PRINTERS

SP-1200 plus 120cps, with NLQ
SP-1500 180cps, with NLQ
SP-5500 180cps, 136 column, NLQ
SP-2000 daisy wheel, 20 cps,

- FAST
 - NEAT
 - LOW COST
 - 12 MONTHS WARRANTY
- SP-1200 plus**

* all prices include Sales Tax



Peripheral and Interface cards:

- Color & Hi-res graphics
- Hard discs
- EPROM Prog's
- Multifunction
- Power Supplies
- Serial Cards
- A/D-D/A Cards
- Memory and more . . .



EMONA COMPUTERS PTY. LTD.

1st Floor, 720 George St, Sydney 2000
Phone: (02) 212 4599

Public Domain

Lotus Hotline..... 123

This month's Hotline is completely above board. We've even placed it on the appropriate page.

New Products..... 126

Sometimes it seems like a Herculean task just to get our heads up from under the pile of new releases which floods our office each month. Here is just part of the deluge. Gurgle, gurgle ...

Your Bondwell..... 133

Customise your autostart — you'll be so glad you did.

IBM Underground..... 134

In his subterranean explorations, John Hepworth has uncovered the universal utility. He wouldn't enter DOS without it.

Your Appletosh..... 136

Tried any double-clicked icons lately? Or would you prefer to double your high-res? The choice is yours.

Your IBM..... 138

Intel, Lotus and Tall Tree have let loose two giant rams. They'll eat your largest spreadsheet for breakfast and be ravenous again before morning tea (sounds like our editor). The cattledogs won't help you control them.

Classifieds..... 140

If you're looking for a bargain, it just might be here.

Your BBC..... 141

Create a constellation of colours by titivating your pixels. Bruce leads the way.

Your Microbee..... 142

Load, decrement, increment and repeat — sounds like a failed gastronomic orgy. But, on the contrary, it's the way to get your PCG characters to eat less memory.

Your C64..... 144

Programming function keys; closing disk files; cheap megabytes for sale; and a reliable IEEEeeeeee ...

Books in Brief..... 145

By Kate Storey. Who else?

Book Review..... 146

This one deserved less brevity.

Clubfile..... 149

Maybe you should try the club circuit — a great place for the latest info on your machine.

Glossary..... 156

My nano's bigger than your pico.

Services/Ad Index..... 160

Next Month..... 162

Some of the best fiction you'll ever read. But based on fact, of course.

The world's best promise of reliability, from the world's biggest seller of floppy disks.

By consistently producing better technology, Verbatim rapidly became the world's biggest seller of floppy disks.

These days, *new* Verbatim disks are so reliable we can confidently warrant they'll last a *lifetime* in constant use.

That's a *human* lifetime, not some vague disk lifetime expectation. Only the world's biggest seller of disks could offer such a warranty.

Exceptional accuracy and reliability is built into every single disk we sell, because every disk is individually tested.

Every Verbatim disk is, therefore, as perfect as a disk can be.

Which is probably why we sell more than any other disk maker in the world.

Verbatim®
Word perfect. For life.



Available at these distributors: New South Wales. Computer Resources Company (02) 516 4099. Computer Supplies (02) 439 5533. Twinlock (02) 698 7288. Victoria. Barries Office Supplies (03) 329 6500. Computer Resources Company (03) 543 5633. Computer Supplies (03) 241 1071. Seasen Software (052) 75 2067. Twinlock (03) 544 4000. Queensland. Computer Resources Company (07) 229 6961. Peter Madden and Company (07) 52 1877. Twinlock (07) 52 4806. Western Australia. Computer Resources Company (09) 381 9588. EDP Supply Company (09) 322 4699. Office Products International (09) 361 7422. South Australia. Computer Resources Company (08) 211 8149. Excel Computer Supplies (08) 42 9918. Universal Software (08) 212 6359.

Also at authorised dealers and retailers.

VB050 MW&S

All Open And Above Board

Just when you thought you had your Lotus system under control, a whole swag of new products has been announced which will have a major impact on the way we think about personal computers.

The wraps have come off **Aboveboard**, a board developed jointly by chip manufacturer, Intel, and Lotus, which breaks the 640 Kbyte memory limit of most PCs.

Without using special techniques, 8-bit microcomputers can directly address only 64 Kbytes of memory, and 16-bit micros only 1 Mbyte. Of this Mbyte, IBM has reserved some 360 Kbytes, so the effective limit is 640 Kbytes. Lotus 1-2-3 is written in assembly language and keeps its whole program and the current worksheet in memory all the time, making the program very fast, but limiting the maximum worksheet size.

Other programs may keep most of the spreadsheet on disk, pulling into memory only the part currently being used; such spreadsheets are limited in size only by the capacity of the disk, but operation will be much slower.

Aboveboard uses bank switching to provide usable memory of up to 4 Mbytes on an IBM PC or 8 Mbytes on an IBM AT, which should help those people now referred to as 'power users'. When 1-2-3 was first released, few computers had more than 256 Kbytes, and it was hard to imagine anyone could use more memory; not many people had thought about an upper limit as high as 640 Kbytes. Most users of spreadsheets now utilise only a small portion of the

commands and memory available to them, while the so-called power users build more complicated spreadsheets too big to fit in the space available.

Naturally, you don't get this expanded memory for nothing. The recommended retail price for the bare bones Aboveboard is \$685, not including tax or memory chips. To attain memory in the multiple Mbyte range you need 256 Kbyte chips, which are more expensive than the same memory using 64 Kbyte chips. The other catch is you have to upgrade to a new version of 1-2-3 or Symphony to use Aboveboard.

Symphony — Release 1.1

Everything about Release 1.1 is bigger: it can use up to 4 Mbytes of memory; it can store more in its files; it requires 384 Kbytes of RAM; and it costs \$1095. However, all the other news looks good.

In the previous version memory was allocated for each cell in the rectangle defined by the top left and bottom right corners, whether there was any data in the last columns or not. Now the data is stored "... in a different manner. Unused cells do not tie up unnecessary memory and data can be stored anywhere on the worksheet." While this is good news for power users, using the large worksheets now available means it's essential to map your worksheet in order not to get lost.

More good news: the new version supports the 8087/80287 maths processor chips, which should dramatically speed up the re-calculation of large worksheets.

One of the failings of Release 1 of Sym-

phony is the way you have to search through two or three manuals because basic and advanced points are scattered at random. I haven't seen the new manuals, but I'm encouraged by the way Lotus has gone about fixing the other problems.

Compatibility

In Release 1 you could use 1-2-3 files in Symphony, but couldn't go from Symphony to 1-2-3. Lotus says "1-2-3 releases 1A and 1A* and Symphony releases 1.0 and 1.01 files will be able to be read by Symphony 1.1. 1-2-3 release 2 files will be interchangeable with Symphony 1.1".

If you have an earlier version of Symphony you can trade it in for \$195, which is probably a reasonable price, especially if the manuals are an improvement.

1-2-3 Release 2

Much of what I've said about the new version of Symphony also applies to the new version of 1-2-3; it will use Aboveboard with up to 3 Mbytes of memory, it stores data in the same efficient manner, it can use the maths co-processor chip, and it costs \$835. 1-2-3 Release 2 will come later than Symphony 1.1, and I have less information about it. However, the following has been announced:

- Release 2 will read Release 1A and 1A* files and macros.
- Files will be interchangeable with Symphony 1.1.
- You can access DOS from inside 1-2-3.
- The worksheet can be 256 columns by 8192 rows.



BE A TYPING STAR

Typestar
PERSONAL TYPEWRITER

- ★ Superb print quality
- ★ Choice of six typestyles
- ★ Electronic editing
- ★ Full-page memory
- ★ Automatic functions
- ★ Complete portability

*...anytime,
anywhere*

Canon
The touch of perfection.

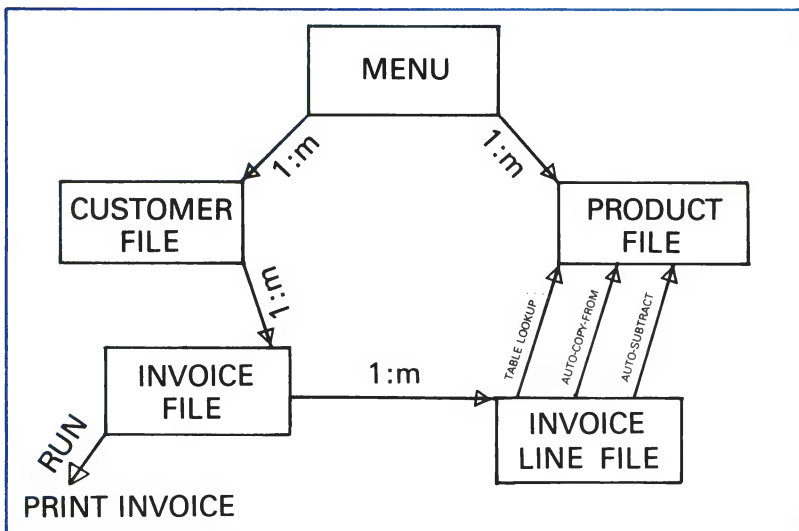
DO IT BETTER!

WITH

Meta 5GL

META-5gl is a powerful new way of getting things done with your computer.

- Because of its power you can make better applications.
- META-5gl is a Non-Procedural 5GL (Fifth-Generation Language) Application Generator based on the ENTITY-RELATIONSHIP model.
- Multi-User and Run-Time Versions are available for MS-DOS, MS-DOS Networks and XENIX.
- Context-Sensitive On-Line Help
- All Documentation on-line.
- Data-Base Oriented with Data Dictionary, Referential Integrity, Transaction logging, Full Security, Field-Level Sensitivity.
- Two Report Generators.
- Menus and Screens Generated automatically.
- Device-independent Screen support including COLOUR.
- Runs on all MS-DOS & XENIX machines, including IBM-PC/XT/AT and compatibles, NEC-APC3, Olivetti-M24, WYSE-1000, APRICOT, HP-150, ICL-36, etc. Multi-user runs on MS-DOS networks, concurrent PC-DOS, XENIX and MICROMATION MP/M.



The above diagram converts directly to a WORKING META-5gl application with less than ONE DAYS work by an experienced user.

Brochure.....	Free
DEMO Disks (Full System, 'Z' & '9' keys disabled)	\$50.00
Manual.....	\$40.00
Full System (Single-User, MS-DOS).....	\$395.00
Full System (Multi-User, MS-DOS)	\$1200.00
ALTOS XENIX (Multi-User System).....	\$1200.00
Full System (Multi-User, Micromation MP/M).....	\$1200.00
Single-User Support (Optional)	p.a. \$150.00
Multi-User Support (Optional)	p.a. \$300.00
Upgrade from Original META4 to META5GL	\$150.00
Original META4 for 8-Bit CP/M (Upwards compatible)	\$195.00

Application of the month!

JEWEL — Retail Jewellers system. Invoices, Duty-Free, Stock, Cash-draw UNIXBUILT (03) 561 1275.

Available from:

SYSTEM SOLUTIONS PTY. LTD.
INCORPORATED IN VICTORIA
28-30 Palmerston St., Berwick, Vic. 3806. ☎ (03) 707 2851

BANKCARD, AMEX,
VISA accepted.



- You can perform regression analysis.
- You can change date and time formats, presumably in the same way as you now can in Symphony.

So far everything I've said relates to software for the IBM PC; now for some news from Hewlett-Packard.

Lotus planned to ship its new release of Symphony in July. Hewlett-Packard had expected to be the first company to offer the new release of Symphony for a non-IBM compatible PC, but says the product first needs extensive testing and won't be available for two to three months after the IBM version.

On the Hewlett-Packard Touchscreen Symphony will have four types of touch: softkey, menu, file/application and zoom (when you touch the middle of a window it expands to fill the screen).

Hewlett-Packard will ship only the new version of Symphony (release 1.1) for the Touchscreen PC family, and is currently investigating the possibility of offering an extended memory similar to Intel's Aboveboard. The new version of Symphony for the Touchscreen will incorporate

all the other enhancements, such as 8087 support, a more efficient memory management system, and improved user documentation and installation procedures.

Symphony for the Touchscreen PC will require 384 Kbytes of RAM and will support Laserjet, Thinkjet and all other Hewlett-Packard peripherals.

Questions And Answers

Q: How do I use my software with Laserjet?

A: Reset the printer by doing an ESC E (refer to your computer manual for information regarding the sending of escape sequences). This places all features to the default conditions (a known state). Refer to Section IV of the Laserjet Owner's Manual for information on the feature access.

Q: In Lotus, I'm using 'setup strings' to print a spreadsheet using a landscape compressed font; the spreadsheet printed well. I then graphed the spreadsheet and did a screen dump from the Hewlett-Packard 150. Why did the spreadsheet print while the graph did not?

A: The printer was still in landscape mode when the screen dump was done. You need to send an ESC E to reset the printer to default conditions or return to portrait mode by sending the following escape sequence: 'ESC&100'. If landscape mode is required, use the printgraph feature of Lotus (you may have to re-position the logical cursor of the Laserjet before printing). The screen dump graphics capability from Lotus can't be done in landscape mode.

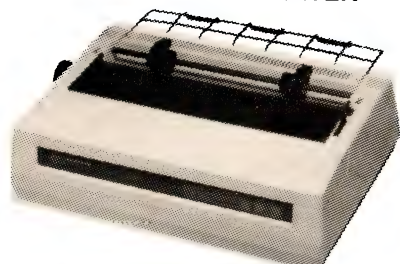
Q: In Lotus, how do I print in landscape compressed mode on a legal-size sheet of paper?

A: In the setup string of Lotus send the following string: 027E027 & I84 plo 2H027 & k2S. This sends a reset to the printer, sends a page length of 84 lines (at 6 lines per inch on 14-inch legal paper), sets the orientation of the character set to landscape, sets the printer in manual form mode, and selects compressed print (16.66 cpi).

Q: Is Laserjet supported on Symphony?

A: Yes, but it is not supported on the Hewlett-Packard 150. □

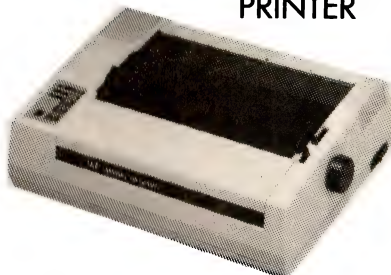
NEW AP650 DAISY WHEEL PRINTER



AP-650 DAISY WHEEL PRINTER from
ALL NAKAJIMA ALL CO., LTD.

- AP-650 is rich in functions of word processing, yet inexpensive, letter quality daisy wheel printer
- Both of parallel (Centronics compatible) and serial RS-232 interfaces as standard feature.
- Paper feed is made by either friction or tractor.
- Daisy wheel and ribbon cassette
- 3 pitch — 10, 12, 15,
- Bi-directional

NEW NP2200 DOT MATRIX PRINTER



NP-2200 DOT MATRIX PRINTER from
ALL NAKAJIMA ALL CO., LTD.

- NP-2200 is a dot matrix printer with a 9-wires print head.
- NP-2200 has wide capabilities and high performance, yet inexpensive
- In FINE mode (17 x 17), far better printing quality is obtained than in normal mode (9 x 9).
- Printing speed is 165 cps.
- Parallel (Centronics)

NEW AE355 ELECTRONIC TYPEWRITER/PRINTER



TYPEWRITER/PRINTER

AE-355 ELECTRONIC from

ALL NAKAJIMA ALL CO., LTD.

AE-355 can meet the wider requirement of document creation.

- One Line Correction Memory
- Auto Centering
- Decimal Tabulator
- Auto Underscoring
- Auto Return
- Paragraph Indent
- ROM, RAM Self Diagnosis
- Memory Back-up for TAB & MAR Position (for 14 days)

MODEL: AE-355

AE-355 has a built-in parallel interface (Centronics compatible). AE-355 works as a daisy wheel printer in case it is linked with a computer

Complete coupon and enclose

payment to:

**PROFESSIONAL
BUSINESS
MACHINES
PTY. LTD.**

P.O. BOX 89
DOONSDIE NSW 2767

Please send me AP650 @ \$540.00 each
plus 10.00 for shipping and handling for each unit ordered.
I enclose cheque/money order/bank cheque for \$.....

Please send me NP-2200 @ \$535.00 each
plus 10.00 for shipping and handling for each unit ordered.
I enclose cheque/money order/bank cheque for \$.....

Please send me AE355 @ \$646.00 each
plus 10.00 for shipping and handling for each unit ordered.
I enclose cheque/money order/bank cheque for \$.....

Bankcard ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
Expires/...../198...

Name

Address

P/Code Telephone

Signature

Software

The Auditor and Bottomline V *Imagineering*, (02) 212 1411 Price: \$195, \$345

Two business software packages aimed at simplifying the use of the IBM PC and the Apple Macintosh computer. The Auditor is designed to audit most spreadsheets commonly used on the IBM PC and compatibles, including Lotus 1-2-3, Visicalc and Supercalc; Bottomline V consists of a number of financial projection templates, which can be used with Multiplan, Lotus 1-2-3 and other spreadsheets to help plan business appointments.

Beach-Head II *Imagineering*, (02) 212 1411 Price: \$34.95

Be a commander in the Allied forces and take on a bloodthirsty, power-crazed dictator, aptly named the Dragon. Stryker's task is to free Allied prisoners held in the Dragon's fortress, bring the bad guys to their knees and reduce the fortress to rubble. One or two players can get into the action — all you need is a disk drive and joysticks. The game incorporates voice synthesis, multiple-play screens and play levels, and sound effects.

Chit-Chat *Personal Computer Software*, (02) 923 2899 Price: \$325

Three-in-one telecommunications software which enables the microcomputer to file transfer between machines, remote file transfer/access viewdata systems like Viatel, and operate public and private electronic mailbox systems. Features include password security, telephone directory, on-line help facility, full-screen text editor and time operation to save phone costs.

Commodore Games *Imagineering*, (02) 212 1411 Price: \$29.95

Commodore 64 users have three new games to master: in Rock 'n Bolt you are a foreman who has to build a 100-storey high-rise in record time; in Master of the Lamps you side with a young prince in a mystical land of genies, magic carpets and magic lamps; and in

The Music Studio your joystick will help you control computer graphics and sound capabilities. Available on 13 cm disks.

dBIII Compiler *Wordtech Systems*, (02) 254 0900 Price: \$945

This package will compile a program written in the dBase programming language into a form that will execute without either dBase III or Runtime. While dBase III runs only on an IBM PC or a 100 per cent compatible with 256 Kbytes of RAM, dBIII Compiler produces code which can run on any MS-DOS machine with 198 Kbytes of RAM. Compiled programs can work with both dBase II and dBase III data files.

Level II COBOL *Arcom Pacific*, (07) 52 9522 Price: \$995

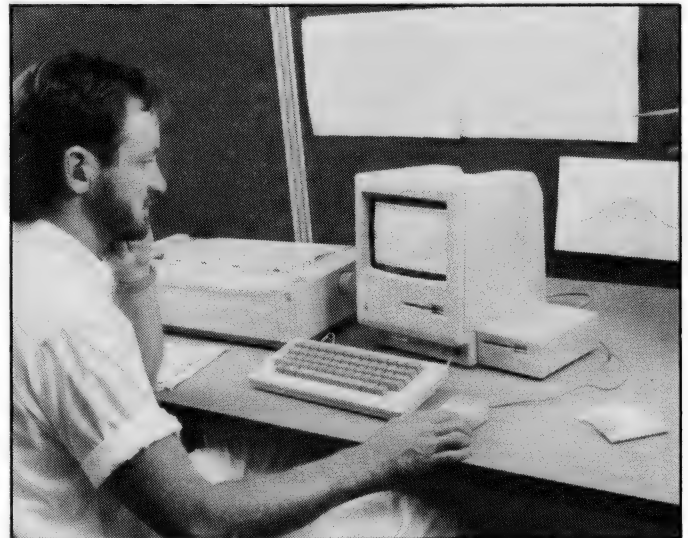
Digital Research has released a two-pass compiler compatible with IBM PC, XT, AT and PC3270 machines. The compiler generates 8086 native code and lets microcomputer users compile and run programs written in full ANSI '74 COBOL with minimal source code modification.

Macsurf *Apple*, (02) 888 5888 Price: \$2000

No, it's not a surfing simulation, it's a surface modelling program for the design of yacht and commercial boat hulls, and sail and surfboards. It allows three-dimensional surfaces to be created, manipulated and viewed, quickly and easily. Macsurf requires virtually no keyboard activity, as commands are chosen by using the mouse to point to them, and curves are also changed by directing the movement of their controlling points around the screen with a mouse.

Microsoft Pascal (Version 3.3) *Microsoft*, (02) 452 5088 Price: \$525

Pascal is able to interface directly with other Microsoft languages, enabling programmers to link Microsoft's newest products, including FORTRAN, Pascal, Microsoft C and Macro Assembler. The package includes a portion of the Microsoft C library to support two function calls. One is System, which lets the user execute a DOS



command without leaving the current program; the other is Spawn, which lets you load and execute another program without leaving the current program.

Microsoft Word, Microsoft File *Microsoft*, (02) 452 5088

Price: \$25 to upgrade Microsoft Word and Microsoft File for the Apple/Macintosh have been upgraded to feature enhanced laser printer support. Word features character formats which toggle from the keyboard and a convert utility feature which allows Microsoft IBM Word documents to be converted to Macintosh Word format and back again. File features the ability to use third-party fonts as well as the standard system fonts in the 'Set Font' dialogue box. Purchases after July 15 can be upgraded free.

Microsoft Xenix-286 Languages

Microsoft, (02) 452 5088
Price: \$595, \$1500, \$850, \$825
Microsoft has released Xenix versions of four high-level languages: BASIC, COBOL, FORTRAN and Pascal, which share compatibility between MS-DOS and Xenix. This source-level compatibility makes it possible to take programs written in a previous MS-DOS version of a language and transport them to the Xenix environment with little or no modification. Programs can also be downloaded from mainframes to the Xenix environment.

Professional Flight Manager *Pittwater Distributors*,

(02) 939 2858
Price: \$400
For use on the Commodore SX-64, Professional Flight Manager gives the operator instant access to computerised flight planning, navigation, flight costing, fuel analysis and route information. The program maintains a database of airports and related information for Australia, and additional airports can be added. Routes and performance details of different aircraft are stored as disk files.

Micro-FCS *EPS Software Consultants*, (02) 439 3722

Price: \$2500
A microcomputer version of the FCS-EPS financial modelling system, this package offers full-screen editing, screen formatting for menu creation, the ability to construct user-defined functions and commands, sensitivity analysis and targeting, and the ability to link external data.

Segaword I *John Sands Electronics*,

(03) 645 3333
Price: \$39.95
With this program and the SC3000 keyboard, the operator can enter text material to the Sega, store it in memory and display it on the TV screen. Features include scrolling and the ability to send written material to the

NEW PRODUCTS



printer for final copy or save it to cassette tape for filing and storage. The program is neatly packaged in a black and silver casing and includes a 32-page user's manual.

Starbridge DOS

Imagineering, (02) 212 1411
Price: \$69.95

A software package which takes control of DOS in the IBM PC to make using the operating system easy, Starbridge DOS presents a single screen divided into four areas: a user-created menu for automatically initiating up to nine programs; a menu for changing system parameters and accessing help; a menu of DOS commands; and a box for input and prompts.

Sytex-Timewise

Sybiz Software, (08)
Price: \$345

Business people in particular will appreciate this package, which combines the Timewise desk organiser with the Sytex word processing system. The word processor is pushbutton rather than menu-controlled and provides 'what you see is what you get' operation. A built-in calculator, a 250-page phone directory, a personal diary, a message holder and an alarm clock should keep busy executives on the ball. MS-DOS, PC-DOS or a compatible operating system and 128 Kbytes of memory are required to run the program.

Peripherals and Extensions

Daisy Junior

Fordigraph Rexel, (02) 647 2488
Price: \$556 (excluding tax)

A compact daisywheel printer for all word processing functions, the Junior is compatible with most PCs, has a print speed of around 13 characters a second and has been tested to 2000 hours of constant use without requiring a single repair. A multi-copy feature enables the user to obtain infinite copies of an original (just what you always needed). The Daisy Junior comes with a standard 7 Kbyte buffer, and will accept either single-sheet or continuous stationery.

ESI Laserconnection

Interface Technology, (02) 438 2899
Price: \$3770 (excluding tax)

A laser connection which interfaces the Hewlett-Packard 2686A Laserjet printer to the IBM Displaywriter system. Underline, overstrike, superscript and subscript are all accessible, as are italic fonts, bold, large and condensed print and the use of several fonts on the same document. The connection includes a controller with 128 Kbyte buffer, cabling and documentation. Interface Technology has put together a

special package — the Laserconnection and printer for \$8500 (excluding tax).

Facit 4513, 4514

EAI Electronic Associates,
(02) 427 3322

Price: \$1200, \$1500 (excluding tax)

The 80-column 4513 and the 132-column 4514 matrix printers include both IBM/Epson and Epson FX command sets, making the units compatible with a variety of computers ranging from IBM PCs to Unix supermicros. Print qualities from near-letter-quality at 35 cps to high-speed draft at 160 cps can be selected by the operator via a switch on the control panel. Printing at 10, 12 or 17 characters per inch may be specified, as can proportional printing.

Fluke 1780A Infotouch Display

Elmeasco, (02) 736 2888

Price: about \$3700

A rack-mountable or standalone computer terminal, the Infotouch

features a touch-sensitive screen, with which even inexperienced users can be directed through complex procedures. In use, the operator is presented with various options on the display screen and responds by touching the appropriate area of the screen. Because the Infotouch Display allows the human interface to your system to be defined in software, the interface can easily be changed to match the skill level of the user, or updated when the system's capabilities change.

IBM Controller Card

Technology Corporation of Australia,
(02) 46 4374

Price: \$895

An American-made floppy disk controller card designed for the IBM PC and the PC XT has just been released in Australia to enable IBM owners to access the new types of drives that are now on the market. The card contains the software required for both for-

TIRED OF ... CONFLICTING PRICES? CONFUSING ADS?

GO DIRECT TO THE
IMPORTERS AND EXPERTS
FOR GREAT DEALS ON
YOUR BUSINESS COMPUTER

RUNS ON IBM AND MSDOS
SOFTWARE

Extras include:

- ★ Software Consultancy
- ★ Lowest Prices
- ★ After Sales assistance

CALL NOW

PERITO HOLDINGS PTY LTD

★★ YOUR COMPUTER WHOLESALERS ★★

2/170 MAIN ST., BLACKTOWN. 2148

(02) 622-2793 (02) 622-7171

matting and operating the high-density drives.

Laserwriter

Apple, (02) 888 5888

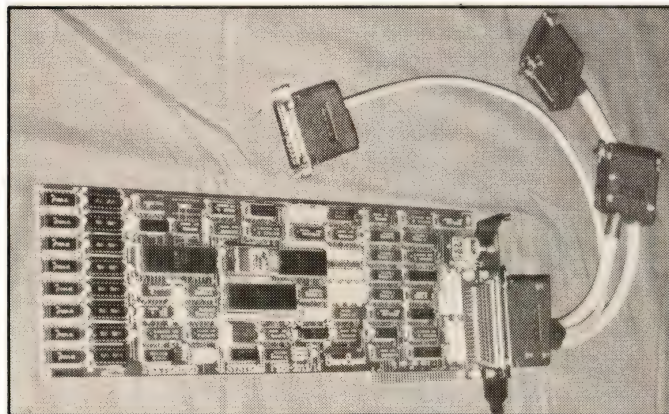
Price: \$11,300

Apple's powerful Laserwriter is being bundled with the 512 Kbyte Macintosh PC equipment and a built-in Appletalk local area network interface which allows connection to up to 31 additional workstations, enabling several users to produce quality print-outs.

PS-5150 Mass Storage Subsystem

Electrical Equipment, (02) 699 9666
Price: \$3246 (excluding tax)

The Teac PS-5150 is plug-compatible with the IBM PC. This single unit combines the SD 510 13 cm hard disk drive with the MT-2ST digital cassette tape streamer, offering a disk data storage capacity of 10 Mbytes formatted and 12.76 Mbytes unformatted, with another 10 Mbytes



on tape. It can transfer 10 Mbytes of data from disk to streamer in two minutes.

Facit 5011, 5012

EAI Electronic Associates,

(02) 427 3322

Price: \$560 (excluding tax)

These two numbers represent new mechanical cut-sheet feeders for use with the Facit 4511/13

(80-column) and 4512/14 (132-column) printers. They're controlled by standard LF and FF commands, and thus require no software changes when installed in Facit printers. Both have a bin capacity of 120 sheets and handle both American quarto and European A4 formats. Sheets can be added during printing, and lids make the feeders almost silent.

Qicstor Plus

Alloy Computer Products,

(03) 529 8455

Price: \$7922 (excluding tax)

An integrated hard disk and tape backup system for PC systems which can be purchased in configurations ranging from 20 to 128 Mbytes. Features include low access time and error correcting ability. Qicstor Plus can be added to any MS-DOS or PC-DOS system by plugging the interface card into the computer's short slot. The unit has its own power supply sufficient for the subsystems and any extra expansion cards plugged into the unit.

Sharespool Expansion Board

Interface Technology of Australia,

(02) 887 2044

Price: \$1260 with 64 Kbytes of buffer memory

Sharespool, by Extended Systems of Idaho in the United States, is an IBM PC or HP 150-compatible expansion board with buffer memory of up to 512 Kbytes. It consists of an adaptor board with three connected cables — one running to the serial printer and the other two connected to parallel or serial ports of two other computers. The adaptor fits into an expansion slot of the host IBM PC or HP 150,

allowing three PCs to share an attached printer. Sharespool doesn't use the host PC's processor to print output, managing all printer queuing itself.

Smartmodem 1200/2400

Netcomm, (02) 498 5577

Price: \$1249, \$1985

Netcomm claims to be the first Australian manufacturer to use the DSP/IA modem chips in its new high-intelligence modem. The Smartmodem features automatic speed and mode configuration; that is, the modem can automatically detect what speed and mode are being used to transmit data and adjusts itself accordingly. Other benefits include automatic dialling, answering and disconnection; synchronous and asynchronous transmission; Austpac compatibility; and audio/visual control.

Teac SD-520

Electrical Equipment, (02) 699 9666
Price: Around \$800

At a height of just over 4 cm, the SD-520 is half the size of the conventional 13 cm hard disk drive. Features include data storage of 20 Mbytes formatted, data transfer rate of five megabits/second and custom LSIs. The MT-2ST cassette streamer can be used as backup memory and to expand the flexibility and range of applications. The addition of the SC-200 controller board enables the hard disk drive to interface with any sort of system.

TK-1000 Touch Sensor

Roycom, (02) 27 1054

Price: \$1700 (excluding tax)

A high-resolution touch-sensitive screen available in 30 cm to 63.5 cm sizes in spherical, flat or round units for most CRTs. It offers flexibility for interactive communication, with a resolution of 250 by 250, so users can interact with a wide variety of data processing equipment.

Videotex Communications Bundle

Apple, (02) 888 5888

Price: \$795

This datamodem and software bundle for the Macintosh represents a \$100 saving on the cost of the individual components. It allows users to access Viatel information services and make

“Truly a miraculous package”

Computer Language - Feb '85

DeSmet C

The most cost effective

Development Package for C in Australia

- Full K&R C Compiler
- Assembler, Linker & Librarian
- Full Screen Editor
- Execution Profiler
- No royalties on generated code
- Fully supported throughout Australia
- Both 8087 and floating point libraries
- Overlays
- First and Second in Aug '83 BYTE benchmarks

only \$195

SYMBOLIC DEBUGGER

- Examine & change variables by name using C expressions
- Flip between debug and display screen
- Display C source during execution
- Set multiple breakpoints by function or line number

only \$95

DOS LINK SUPPORT

- Uses DOS OBJ Format
- Links with DOS ASM
- Uses Lattice naming conventions

only \$70

Also available

TOOLS (\$65)

GRAPHICS (\$65)

UTIL (\$45)

HACKER (\$45)

Contact

The Computer Trader

3 Bowen Cres.,

MELBOURNE 3004

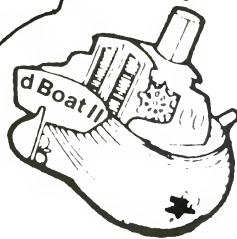
Telephone Orders

(03) 266 1995

Relational
Database

DATAFLEX...

**More than
the tip of the
iceberg.**



20
TM

**NOW FOR
XENIX AND
DOS 3.1**

DATA

**Simply stated ... the
industry's most powerful
application development
software is also the
easiest to use.**

AVAILABLE ON: CP/M, CP/M-86, MP/M-86, MS-DOS,
PC-DOS, Molecular N-Star, Televideo Mmmost, Omninet,
TurboDOS, Novell ShareNet, PC-Net, DMS Hinet,
IBM 'PC' w/Corvus, OSM Muse.
3-COM, CCP/M-86, M/NET, DAVONG, X-NET
Ask us about our training courses



AUSTRALIAN MICROCOMPUTER SOLUTIONS

CURRABEG HOUSE
248 LATROBE TCE., GEELONG 3220
Telephone (052) 211-085 (052) 211-300

DEALER ENQUIRIES WELCOME

Please send me more information on Dataflex

Name

Address

Postcode

Telephone

AMS AUSI

NEW PRODUCTS

complete files of videotex transmissions or cut and paste from videotex during transmissions. Saved material can later be edited as Macwrite documents.

New Machines

Concept 2000

Harris Lanier, (02) 957 6500

Price: \$5106

An IBM-compatible PC with single-board design, this new machine features a 35.5 cm screen with tilt and swivel adjustment and a keyboard with dual-position height adjustment. The package includes the MS-DOS operating system, GW-BASIC and user manuals.

Concept III

Harris Lanier, (02) 957 6500

The Concept III series of integrated office equipment includes

the 1100, 1200 and 1400 desktop terminals; the 2000 IBM-compatible PC; the 4000 server and the 6000 server. This archival retrieval service operates on Xenix, allowing users to search up to 5000 pages in less than 10 seconds. Xenix also provides multi-user capability and gives users access to Multiplan, Infomix and other Unix-based application packages. Concept III can be purchased as a 'family' or as individual pieces.

Tandy 200

Tandy Australia, (02) 675 1222

Price: \$1399

Tandy's 200 is a second-generation portable computer with 16-line 40-character display and six built-in programs, including Multiplan.

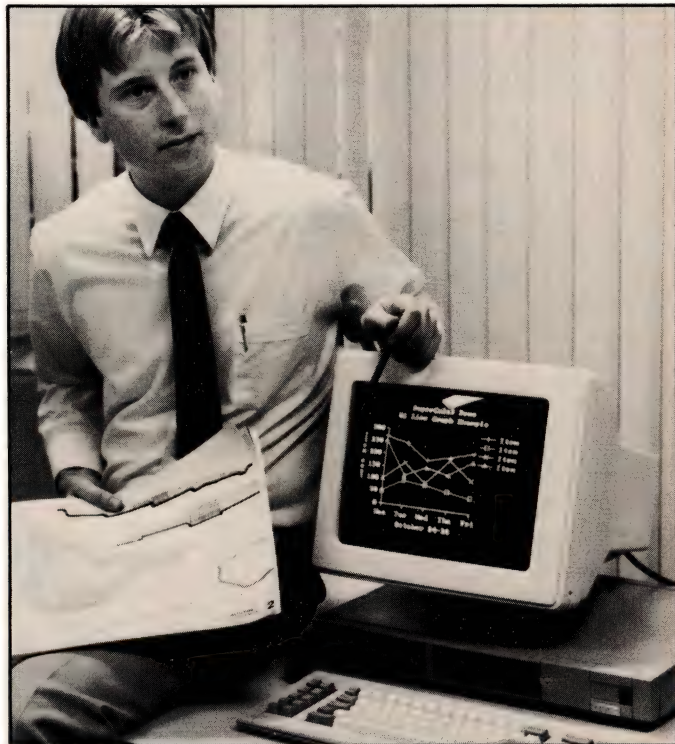
Televideo AT

Data Peripherals, (02) 888 5733

Price: \$6770 and \$9090

(excluding tax)

Televideo has released two AT-



model PCs aimed at the 'power user' who is looking for greater software processing speed and disk operation, and increased memory and storage capacity. The systems are IBM PC/AT-compatible, and come packaged with a system model, keyboard and high-resolution text and graphics monochrome monitor. The Model 1 is the entry-level system with 256 Kbytes of RAM, while the Model 2 includes 512 Kbytes of RAM and a 20 Mbyte (formatted) Winchester disk drive.

ing the NCR inhouse DLC communications protocol.

VZ 300

Dick Smith Electronics,

(02) 888 3200

Price: \$199

The VZ 300 computer is suitable for beginners, and can be used with a wide range of peripherals. It comes with cables that will allow it to be plugged into a television, monitor or cassette recorder.

Services

Infosearch

IBM, (02) 234 5678

Price: Free!

An electronic help service which enables IBM PC users to access a database containing approximately 4000 questions and answers about the IBM PC. Infosearch will be available free of charge to every IBM PC user in the country either directly, through the new technical co-ordinator program, or through a dealer. Technical co-ordinators and dealers will be able to dial into the service with the help of an IBM PC, communications facilities



SoftEyes™
EASY TO INSTALL FILTER

**Screens Out VDU Glare
and Relieves Fatigue.**

Filters for Monochrome or Multi-Colour VDU's

WORD EXPRESS

COMPUTER SUPPLIES

99 York Street, Sydney Telephone (02) 290 3100

WE 01



and a modem. Answers will appear on the user's PC screen.

Goldengate Newsletter

Cullinet Software, (02) 957 3266
Goldrush is a quarterly newsletter to keep users up-to-date with the latest information on the Goldengate integrated PC software package, released in Australia last November. The publication will report the latest news, product announcements and technical information concerning Cullinet's software. Users are invited to submit questions, new procedures, creative applications or hints for publication in a regular feature quaintly referred to as 'Customer Corner'

Furniture

Deskmate Keyboard Storage Drawer

Computer Products Network
 (02) 290 3100
 Price: \$99

The Keyboard Storage Drawer incorporates a built-in wristrest and suits keyboards up to 508 mm by 240 mm by 70 mm. The drawer pulls out and automatically locks in an operating position. It is colour co-ordinated

with IBM hardware, and can be fitted underneath desks. A suggested application is on typewriter credenzas where conventional typewriters are replaced by word processors.

Miscellaneous

Audio-Visual Computer Training System


Learning Automation,
 (02) 957 3235

Price: \$395
 A computer training system which connects to your microcomputer and provides synchronised sight and sound lessons on popular software packages such as Wordstar, Multiplan, dBase II, Lotus 1-2-3 and BASIC. Lessons are also available on the NEC APC III and IBM PC microcomputers and operating systems. Other packages are planned.

Disk Warranty

Verbatim, (02) 9929 8811
 Price: \$4.50, \$5.50 for disks
 Verbatim has announced a lifetime warranty on the 13 cm and 20 cm Datalife floppy disks, now packaged in a snap-lock moulded box which locks in the open position for easy access.

DEALER
ENQUIRIES
WELCOME



MONITOR MOVER

An aesthetically pleasing, ergonomically
functional, space saving,
commonsense computer accessory.

WORD EXPRESS

COMPUTER SUPPLIES

99 York Street, Sydney Telephone (02) 290 3100

WE 012

Computers for Genealogy

Clark Consultants, (02) 427 5954
 Price: \$4.50
 This booklet is a basic guide to buying a computer for running genealogical software. It also lists historical databases which are on computer and supplies information on the Society of Genealogist's computer program for indexing the contents of its library.

Diskette Copier

Nashua, (02) 925 3111
 Price: \$10,500
 This disk-duplicating system formats, duplicates and verifies 20 cm, 13 cm and 9 cm disks. A large hopper holds up to 80 disks and provides automatic sorting. On-screen prompts and visible output bins allow the operator to monitor progress at a glance. Interfacing requires two cables and the software disk.

PAT-2+

Dabo Computer, (02) 958 1900
 Price: \$1795 (excluding tax)
 A Dyan handheld performance and alignment tester for 13 cm and 20 cm disk drives with standard flat cables and power supply. The tester can be used for other drive performance tests, such as random seek, write/read capabilities, format and verify

tracks and rewrite sectors. It can also function as a simple drive exerciser to position the drive head when used with the analogue alignment disk.

Programming Reference for M68000 Family

Motorola, (02) 438 1955;
 (03) 561 3555
 Motorola has released a programming pocket reference guide and three programming reference cards for the M68000 family. They describe all instructions for the MC68000, MC68008, MC68010 and MC68012. Each programming reference card provides a quick guide listing all instructions, addressing modes and necessary tables for programming and debugging.

Educational Software Sourcebook

Tandy, (02) 657 1222
 Price: \$14.95
 A reference manual to assist teachers all round Australia to source and locate software designed specifically for classrooms and school administration. It lists more than 600 packages which run on the various Tandy computers and provides a package description plus details of how the packages can be purchased. □



The Computer Trader

Phone Order Specials
(03) 266 1995 (Reverse charges)
Phone now!

**SEND NO MONEY
 NOW – PAY ON
 RECEIPT OF GOODS!
 MANUFACTURERS'
 WARRANTY ON ALL
 PRODUCTS**

**No-one will beat
 us on these
 Hard Disk
 Systems...**

IBM PC "XT" SYSTEM

System unit with 256K RAM, 10Mb internal hard disk, serial and parallel ports 360K drive, keyboard and high resolution monochrome monitor.

Competitive Price: \$5,250

OUR PRICE: \$4,950

OLIVETTI M24 PC "XT" SYSTEM

Configured as for IBM above.

Competitive Price: \$5,155

OUR PRICE: \$4,850

NEC APC III SYSTEM

Configured as for IBM above except for 640K disc drive.

Competitive Price: \$5,295

OUR PRICE: \$4,950

**CALL FOR A QUOTE
 ON ANY SYSTEM**

We can supply Televideo, IBM compatible, Apple McIntosh, Hyperion, Sanyo, T.I., DEC, Data General



**LOOK AT THIS
 FOR VALUE**

Hardware

Printers

NEC – P2 Pinwriter	\$ 955
NEC – P3 Pinwriter	\$1255
NEC – Spinwriter 3500 (33cps LQ)	\$1860
Epson – FX80+	\$ 699
Epson – FX100+ (WP option-call)	\$ 985
Epson – LQ 1500	\$1699
H. P. Think-jet Serial Printer	\$ 829
Brother, C-Itch, Microline, Silver-reed	CALL

Monitors

Kaga Taxan Amber or Green	\$ 275
Kaga Taxan Vision III Colour	\$ 699
Roland MV 1212 Green or Amber Composite	\$ 385

Hard Disk Drives

Tandon 10Mb	\$1355
Mitsubishi 20Mb	\$1750
Everex 10Mb	\$1595
Everex 20Mb	\$1850
Tallgrass, Sigma, Sysgen, Tandon or Mitsubishi	CALL

Boards – IBM Compatibles

AST Megaplus 6 Pack Multifunction	\$ 645
Sigma – Maximiser	\$ 495
Qubie – Six Pack	\$ 445
Persyst 64-640 serial/para. port	\$ 605
Hercules Colour	\$ 325
Hercules Graphics	\$ 655
Persyst Colour	\$ 308
Hercules Compatible Graphics	\$ 455

Accessories & Supplies

Data Netcomm PC In-Modem 300, 1200/75	\$ 735
64K Memory Upgrade (9 chips)	\$ 65
Disks – DSDD Nashua	\$ 39
Supertrader Special. Warranty supplied	\$ 22
Other Brands and Sizes	CALL

Software

Word Processing

• Perfect Writer II	\$ 265
• Wordstar 2000+	\$ 495
Multimate	\$ 455
Wordstar 2000	\$ 425
Wordstar Propak	\$ 435
Wordperfect	\$ 450

Spreadsheets/Integrated Packages

• Lotus 1-2-3	\$ 535
• Symphony	\$ 685
Enable	CALL
Framework	CALL
Multiplan	\$ 285
Open Access	\$ 695

Desktop Environments and Sundry

• Homebase (more features than Sidekick)	\$ 89
Sidekick	\$ 89
Polywindows	\$ 89
Flight Simulator	\$ 85
Dollars & Sense	\$ 89
Electric Desk	\$ 465
Spotlight	\$ 195

Communications/Productivity Tools

• Crosstalk	\$ 165
• dTOOLKIT	\$ 99
Smarterm 100 (DEC Emulator)	\$ 295.00
Smarterm 400 (D.G. Emulator)	\$ 295.00
Prokey	\$ 185.00

Database Systems

• Versaform	\$ 199.00
dBASE II	\$ 495.00
dBASE III	\$ 665.00
Knowledgegeman	\$ 645.00
Quickcode III	\$ 325.00

Languages/Utilities

• DeSmet C (Symbolic debugger \$95.00)	\$ 195.00
Concurrent CP/M 86	\$ 255.00
Microsoft products	CALL
PC-Alien	\$ 89.00
Sideways	\$ 79.00
80-Mate (runs CPM 80 programmes under MS-DOS)	\$ 245.00
Smarm Key	\$ 69.00
Norton Utilities	\$ 145.00
Copywrite	\$ 95.00

Actioning

Attache (Depends on modules)	CALL
Integrity	CALL
Tally	CALL
Sybiz	CALL
Charter Series (IAL)	CALL
Magnabiz \$ 775.00	
Harvard Project Manager	\$ 595.00

Vertical Market

Building/Printing/Hospital & others	CALL
-------------------------------------	------

***SUPERTRADER
 SPECIALS**

ANY PRODUCTS NOT LISTED – CALL, CALL, CALL!

BANKCARD & VISA CARD ACCEPTED

Handling charges \$7.50 on all software, boards and accessories. In the unlikely event that our costs change without notice we reserve the right to alter prices.

The Computer Trader, 3 Bowen Cres., Melbourne
Telephone: (03) 266 1995 (Reverse charges Interstate/Country)

Automatic startup

The Bondwell has been set up to automatically execute a program called Autorun when switched on. Autorun displays the names of executable programs from the disk directory and prompts you for the name of the program you wish to run. While this is a useful facility, the automatic startup can be enhanced to do other tasks which would otherwise be a chore.

The first step is to abandon Autorun as the default startup program, since CP/M 3 supports a more useful list of startup commands. It operates with a program called Submit, so you'll need the file SUBMIT.COM on disk drive A, and one called PROFILE.SUB, which contains the above-mentioned system commands.

To see how the facility can be used, consider the things which have to be done to start Wordstar. First the default disk drive must be specified, then the special function keys initialised; sometimes the keyboard has to be re-arranged slightly and the system advised of which printer port to use. With CP/M 3 all these tasks can be done by the automatic startup command file.

Another important feature of CP/M 3 is that it allows you to specify the sequence in which drives are to be searched for files when the operator (or a program) doesn't specify the drive number as part of the filename. This search sequence can be defined using the SETDEF utility.

With a program like Wordstar the usual arrangement is to keep a data disk with the document files on it in drive B, and the Wordstar program disk with other utilities such as PIP in drive A. If Wordstar is started with B as the default drive, files stored on B don't have to be referenced with the 'B:' prefix — Wordstar will attach a 'B:' to the front of all data filenames for you. However, the system can be told that all references to a program should assume the 'A:' prefix, so they'll be searched for on the A drive; the B drive will only be searched if they aren't found on A.

SETDEF.COM is the utility which permits you to do this. The command SETDEF A,B: tells the system that any requests for files which don't have an explicit drive reference — such as the requests Wordstar will issue for its own overlay files — should be resolved by searching drive A first, and

*The automatic startup
can be enhanced to do
some additional tasks
which would otherwise be
a chore.*

drive B only if the file can't be found. For the command to work the program SETDEF.COM must of course be on the disk.

The next command in the startup sequence might be a program to initialise the keyboard to a particular arrangement. For instance, in Wordstar it's convenient if the shifted arrow keys are arranged to perform the corresponding exaggerated cursor movement. For example, the up-arrow can move the cursor up one line while the shifted/up-arrow will move it up one paragraph. These functions can be allocated using the program published in the first Bondwell column, and replacing the letters 'A', 'B', 'C' and 'D' with the numbers 18, 3, 1 and 6 respectively.

If such a program was in a file called KEYS.COM on the Wordstar master disk, the second command of the startup procedure would simply be KEYS.

The third startup task might be to run a program created in SETUP to initialise the special function keys and the serial ports in the correct configuration. This involves going through the SETUP procedure and saving the results to a .COM file called, say, WSSTART.COM. Thus, the third command of the startup procedure would be WSSTART.

Run SETUP after you've initialised the special function keys through the supplied AUTORUN startup procedure for each applications package. The keys will then be defined and can be saved to the WSSTART file after setting the serial port parameters (if any).

If you have a printer plugged into one of the serial ports, you may wish to let the system know during the startup procedure. The command DEVICE LST:=SI00 (or perhaps SI01) would be the fourth line of the startup command. If the baud rate has to be set, an additional option such as

{XON,9600}, which sets it to 9600 baud, is needed. (Note: the file DEVICE.COM must be on the disk in order for this command to work.)

If your printer is attached to the parallel port the DEVICE command line isn't required, since the system assumes LST:=LPT.

Finally, you'll want to start running the applications program. If you want to start Wordstar with drive B as the default drive, log into drive B and type WS. The search path defined in the SETDEF command ensures that Wordstar will be found on drive A and executed with drive B as the default drive.

Note that WSI.COM is an installed version of Wordstar and uses inverse video display for highlighting. You can see how it looks by entering WSI instead of WS to start Wordstar. If you decide you prefer the display of WSI you can erase WS.COM and rename WSI.COM WS.COM. Alternatively, you can just erase WSI.COM.

The complete PROFILE.SUB file is shown in Listing 1. It can be prepared in Wordstar, but the 'N' (non-document mode) should be used to eliminate any possible problems with control characters making their way into the file. All you need to make it work is PROFILE.SUB and SUBMIT.COM on the disk in drive A when CP/M is started.

Our example listing assigns the printer to serial port 0 and sets the baud rate of the port to 9600 with XON-XOFF protocol. The procedure is essentially the same with other programs, although Datastar seems to have different procedures for determining the drive number for data files. The command sequence can include any of the CP/M commands such as SHOW or DIR, provided there is no pause between commands. If you want to check out the screen displays as you go you have to use Control/S and Control/Q to pause and restart the display. □

```
Listing 1 - PROFILE.SUB
setdef A:,B:
keys
wsstart
device lst:=si00[xon,9600]
b:
ws
```

UTIL — The Universal Utility Program

What's your pet PC hate? Mine is having to use DOS to browse through a new disk, or to selectively copy or delete files from a disk. Doing a DIR with DOS just gives a list of files in random order. TYPEing a file sends it scrolling past. Using a word processor is amazingly time-consuming if each file has to be loaded and quit. COPYing and ERASEing are tedious if done file by file, and dangerous if wildcard characters (* or ?) are used.

But I don't have to suffer any more — I use a program called UTIL for all my file management tasks (and other useful applications as well).

What can UTIL do? UTIL turns your printer and PC into a typewriter so you can type direct to paper. It can redefine your keyboard so any key can be a different character or string of characters, and it has a crude database. But UTIL's most useful feature is the sorted directory, from which files can be copied, deleted, browsed through or printed.

Why so many functions? DOS has a minimum number of spaces to allocate to files. On a 360 Kbyte floppy, space is allocated in clusters of 512 bytes, and my hard disk has 4096 byte clusters. If a file is shorter than one cluster the rest of the space in the cluster is wasted. If a file is longer than one cluster space in the last cluster will be wasted. On average each file wastes half a cluster, so combining functions into one program (and thus one file) can save heaps of disk space.

But there's another reason for combining functions. Compilers take your source code and turn it into a file the machine can execute. To do so they have to add other routines to handle arithmetic, input, output and other functions. This dramatically increases the size of the final file; IBM's BASIC compiler adds about 18 Kbytes in overhead, Turbo Pascal about 10 Kbytes, and other compilers add more. If each function is compiled as a separate file each file incurs the overhead burden; if many functions are combined into one file the overhead is only incurred once. Combining six functions into one program with the

BASIC compiler saves nearly 100 Kbytes.

The Sorted Directory

As useful as the other routines are, the strength of UTIL lies in the sorted directory. Let's take a tour and see what happens.

At the DOS prompt, type UTIL. Up comes the first menu, and by typing the two letters next to the option, followed by <enter>, the option is chosen. All file manipulation can be done from within the sorted directory (including file browsing), but browsing can also be done from the first menu.

Selecting SD, for sorted directory, results in a two-column directory. If the files in the chosen directory don't fit on one screen they can be seen by scrolling the screen sideways.

All functions within sorted directory mode are performed by moving the cursor over a filename and/or pressing one key. The sample directory is sorted in alphabetical order by filename. Pressing <X> re-sorts the directory into order by file extension, with subdirectories first.

Topward

MODEL 4303 **\$445.00***

MODEL 4302 **\$429.00***

MODEL 2303 **\$255.00***

MODEL 2302 **\$229.00***

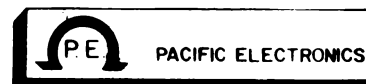
*Plus Sales Tax.



Regulated DC Power Supplies

FEATURES:

- 4303 (4302) Triple Output — ± 30 volt/3A (2A) +5 volt 3/A
- 2303 (2302) Single Output — ± 30 volt/3A (2A)
- Constant voltage and current capability
- Short circuit protection
- Extremely low ripple and internal resistance
- Compact size



45 Wellington Street Windsor 3181
(03) 529 8500 Telex: AA 38432
AGENTS: SA (08) 264 5237
QLD (070) 51 2404

DEALER ENQUIRIES WELCOME

Home Directory : C:\september			90112 bytes free		
Viewing Directory : c:\					
File Name	Date	Time	File Name	Date	Time
10.BAT	07/01/85	09:29p	BACKUP.COM	08/02/83	10:05p
11.BAT	01/01/80	00:04a	BAK.BAT	12/31/84	02:25p
12.BAT	01/01/80	00:04a	CHKDSK.COM	01/30/84	12:00n
13.BAT	06/18/85	08:19p	CHKMACH.COM	03/12/84	03:38p
14.BAT	01/01/80	00:04a	COMMAND.COM	01/30/84	12:00n
15.BAT	01/01/80	00:05a	COMP.COM	01/30/84	12:00n
16.BAT	06/18/85	08:15p	CPY.BAT	04/27/85	18:11p
17.BAT	06/18/85	09:28p	DF.BAT	02/16/85	02:34a
18.BAT	06/18/85	09:30p	DISKCOMP.COM	02/18/84	12:16n
19.BAT	06/18/85	09:16p	DISKCOPY.COM	02/18/84	12:22n
ADDBOOT.COM	03/10/84	03:18p	DOSEEDIT.COM	01/16/85	02:49p
ALIEN.MNU	05/13/85	09:41p	EDLIN.COM	01/30/84	12:00n
APPOINT.APP	02/12/85	10:00p	FDISK.COM	01/30/84	12:00n
ASSIGN.COM	01/30/84	12:00n	FIND.EXE	01/30/84	12:00n
AUTOSTAR.BAT	01/01/80	00:01a	FONT.COM	11/01/83	00:00a

A sample sorted directory from UTIL.

Pressing <D> re-sorts into creation date order, and pressing <A> goes back to alphabetic sorting.

But what if the root directory is of no interest, but a subdirectory has the files you want? Use the arrow keys to place the cursor over the subdirectory name, and press <enter>. UTIL will now read the subdirectory, and sort the entries for display. Other one-key functions allow the current drive to be changed while you move back up to a higher directory.

Browsing, Deleting and Copying

Files can be browsed through and marked for copying or deletion by placing the cursor over the filename and pressing to browse, <Alt-D> for deletion, or <Alt-C> to copy.

Browse is like a read-only word processor. UTIL can't alter or edit the file — it reads from the disk, one screen at a time, under full user control. UTIL presents the first screen to the operator, who pages through the file with the <PgUp> and <PgDn> keys. Pressing <Esc> takes UTIL back to sorted directory mode. Some browsing programs load the whole file into RAM and can only browse through files shorter than a preset limit, but UTIL can browse through files of any length.

Wordstar creates files with some characters other than the normal alphabet. These will be hard to read if you try to browse through them in the manner described before. UTIL foresaw this — if you want to browse through a file created by Wordstar, press <Alt-B> and all odd characters will be translated. While in browse mode, sections of file can be marked for printing. Pressing <P> then prints the marked portion of the file.

Deleting and copying files is also done from the sorted directory. In each case the cursor is placed over the filename of interest. To mark it for deletion, press the

<Alt> and <D> keys simultaneously. Any number of files can be marked like this. Actual erasure only occurs after pressing <Alt-X>. If you leave the sorted directory with files still marked for deletion, UTIL will ask if they are to be deleted.

Copying is done similarly, by placing the cursor over the filename and pressing <Alt-C>. On exiting UTIL a batch file is created on the default drive, and all marked files are copied onto it. Marking a file is not final, and any marking for deletion or copying can be removed by pressing <Alt-U> to Undo the marking.

Other Functions

UTIL allows you to run your favourite editor or word processor from within Sorted Directory mode by placing the cursor over the filename and pressing <Alt-E> for the editor, or <Alt-W> for the word processor. <Alt-S> is a similar, but user-defined, command which can call other programs such as assemblers and compilers.

Copyright and User-Supported Software

UTIL is user-supported software; it's copyright, but the author has allowed all users to copy it and give copies to any other person. In return, satisfied users are asked to send a donation of \$US10 — not much to pay for such a great program — to the author.

The Sydney IBM PC user group has a bulletin board on (02) 238 9034, located in the computer section of Grace Bros' Sydney shop, using equipment loaned by Grace Bros. Registered users of the board can download UTIL from the copy I have uploaded. Visitors can log on and get registration information. Requirements for use of the system are 300 baud, 8-bit word length, no parity and one stop bit.

UTIL is so powerful I can't possibly describe it fully here, but the notes above should whet your appetite. □

BACKUP PROTECTED SOFTWARE

with
**COPY II
PLUS™**
ver. 5

From the team who first brought you **COPY II PLUS** in 1981 comes a completely updated disk utility for your Apple II computer.

New features include:

- Fully automatic bit copy. All parameters are stored on disk. Simply type in the name of the program you wish to backup, and **COPY II PLUS** does the rest!
- New utilities including Alphabetize Catalog, Fast 2-pass Disk Copy on a IIc or IIe, and on all-new Sector Editor.
- Supplied on a standard DOS diskette. Runs on the Apple II, Apple II+, Apple IIe, Apple IIc. Requires 64K and one or two disk drives.

Increase the power of your Apple II...

Use **COPY II PLUS™ 5.0**

Call M-F 8.30-5.00 (W.
Australian time) with your

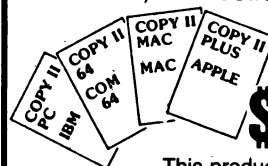


(09) 481-0074

Or send a cheque (add \$5 s/h) to:

CENTRAL POINT
Software,

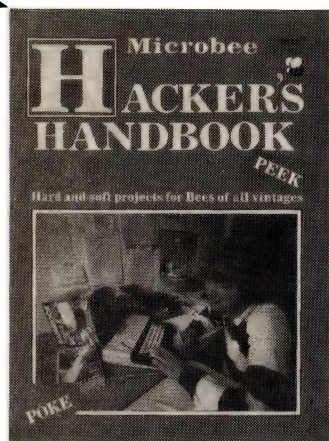
557 Wellington Street,
Perth, W. Australia. 6000.



\$69.95

This product is provided for the purpose of enabling you to make archival copies only.

Microbee HACKER'S HANDBOOK



From the publishers
of 'ETI' and 'Your
Computer' magazines.

The Microbee Hackers Handbook will tell you how to:

- Get more from the Bee's graphics capabilities.
- Set up for telecommunications on the Bee.
- Play music on the Bee.
- Build a joystick and a light pen for the Bee.
- Get hardcopy — cheaply.
- Expand your 16K Bee to 32K
- Make the Bee a better games machine.
- Turn your Bee into a facsimile decoder.
- Solve equations on the Bee ... and much more!

★
\$6.50 at your newsagent now.

What About The IIs?

With all the current hype about the Macintosh, my faithful Apple IIc has been sitting in the corner gathering dust, so I decided to find out what Apple is planning to do with the II family.

Since the 'Palace Revolution' in June it has become increasingly difficult to find out what Apple is planning; the new regime has different ideas. The other problem is working out which rumours started when — anything prior to Sculley's coup, for example, could be invalid now. Anyway, I'll pass on what I know.

The statement 'Apple II forever' may well be true; it is by no means dead. There is rumour that we'll soon see an 800 Kbyte microfloppy drive for the II. The drive, made by Sony, is quiet and fast, and ProDOS-based. With an accelerator card and the 1 Mbyte RAM card the system should be extremely powerful and fast.

The enhanced Apple IIe has been released in the United States and is due to arrive in Australia very soon (if not by the time this is published). The IIe is now effectively a IIc; it will run all the same software, and has mouse characters and the 65C02.

The Appletalk network is still not fully functional, but does give a link between the Apple II and the Macintosh.

Finally, I expect we'll see a range of 128 Kbyte double high-resolution colour programs coming out in the near future. With the current Apple Monitor 100s (which aren't available in this country because of cost), the quality of the double high-resolution is exceptionally clear. In fact, you can use the monitor as an 80-column display without loss of resolution. With the cost of colour monitors coming down we may well see these quality units within our reach very soon.

Double-clicked Icons

If you click twice on the functions shown in Figure 1, you'll achieve interesting results, as you can see.

While on the pencil icon, if you press down the option key after selection of the pencil the pencil turns into the grabber. When you release the option key it returns to the pencil.

Changing font sizes requires similar commands to those used with Word. The > key makes the font larger and the < key makes it smaller. The shift key and the > or < cycles through the fonts. (Word uses the shift and < > keys for font sizes.)

Move 'Em Out

To lasso or to box? Although these two selections look similar, there are some important differences. The box (on the top line) actually cuts out a piece of the drawing, while the lasso captures an object without the white spaces. An interesting feature of the lasso is you don't have to complete it; when you release the mouse button Macpaint connects the ends with a straight line.

Perfect Circles

To make a perfect circle, simply hold down the shift key. The same can be done for perfect squares, and used with the polygon shape all angles are at 45 degrees or multiples.

The final tip is the use of the option key while drawing one of the shapes. If you use the thin line and hold down the option key while drawing a box you get a box with a dotted line border (no border if using a pattern). If you select a bigger border you'll get a border with the selected pattern.

That's all for now. If you have any tips on Macpaint, Write or other popular Macintosh programs I'd be interested in hearing from you so I can pass them on. □

Grabber	Show full page
Selection box	Select all of the window
Paintbrush	Edit screen so you can change the brush
Shaperubber	Clear the whole window
Any pattern box	Edit patterns
Pencil	Same as entering fat bits. (However if you press the command key — next to the option key- and click you enter fat bits at that point.)

Figure 1.

Your Sole Source for Quality Peripherals

High Speed
EDP

Medium-speed
Heavy duty
Silent Scribe

Dual mode
Low duty
WP/EDP

Dual mode
Heavy duty
Letter quality
WP/EDP

Letter quality
Variable type
WP printer

Line Printers
Laser Printers

IBM 3270
compatible

Retail/POS
Ticket/Slip

Terminals
14" amber
Multiple
emulations

Terminals
DEC compatible

Colour
printers

DP6500

DP9500B

DP9620B

DP9625B

P2

P3

5025 PRINTSTAR

WP6000

EII

2000

3500

8800

DP9632B

7000

4000

4110

210 (80 col.)

230 (132 col.)

219 (VT100)

220 (VT220)

CP2

CP3

DP9725B

Take a look at



Importers & distributors of top quality
peripherals from Anadex (Printronix), Ampex,
Eaton, JBCO (NDK) and NEC.

Experienced technical support and
maintenance Australia-wide, plus informed pre-sale
advice.

Competitive pricing and fast delivery.

Streamlines all of your purchasing decisions.

Mail coupon to: DATASCAPE Pty. Ltd.
Sydney office: 44 Avenue Rd., Mosman. Tel: (02) 969-2699
Melbourne office: 183 Bank St., South Melbourne. Tel: (03) 690-3622

I would like to know more about

Please ☐ send literature ☐ call me

Name

Title RYDG

Company

Address

Phone Postcode

W.A. (09) 277 7707 S.A. (08) 243 2107 Tas. (002) 728 622 Qld. (07) 371 7366

Freedom for your information

Giant PC RAM

THE ONE great advantage the PC-AT has over its older brother, the PC, is that it has an 80286 instead of an 8088 processor chip. Apart from a speed advantage, the 80286 can directly address up to 16 MBytes of RAM, while the 8088 can only handle 1 MByte. System requirements account for 360 Kbytes of that address space, so the actual limit on user RAM in a PC is 640 Kbytes if the motherboard has 64 Kbyte RAM chips, or 544 Kbytes with 16 Kbyte RAM chips.

To anyone coming from 8-bit machines with a 64 Kbyte limit, 640 Kbytes sounds enormous, but with modern software it can really cramp your style. Any serious work would require 512 or preferably 640 Kbytes. I chew up 200 Kbytes with my hard disk operating software, DOS, a 64 Kbyte print spooler and Sidekick. And that's before loading any application software! Symphony, Lotus 1-2-3, Word and other programs which load the whole data file into RAM require vast amounts of memory — around 300 Kbytes for Lotus and 400 Kbytes for Symphony. Using multi-tasking operating systems or utilities makes the situation even worse.

You could get extra memory for all these tasks by selling the beloved PC and upgrading to the AT, except for a couple of tiny details: the AT is three times the price of a PC; PC-DOS 3 can't handle the memory above the PC's 640 Kbyte user memory limit, even on the AT; and popular software is not available for those operating systems which can address the extended memory of the AT. The solution comes, with some limitations, from a partnership of Intel and Lotus, and separately from Tall Tree Systems with hardware/software packages which allow a PC to handle umpteen Mbytes of RAM.

To anyone coming from 8-bit machines with a 64 Kbyte limit, 640 Kbytes sounds enormous, but with modern software it can really cramp your style. Any serious work would require 512 or preferably 640 Kbytes.

The Aboveboard

The Intel/Lotus solution is the Expanded Memory Specification, which takes the memory limit of a PC to 8 MBytes. The first announced hardware product is Intel's Aboveboard. Available in versions for the PC and the AT, each Aboveboard can pack 2 Mbytes of RAM, and two Aboveboards can be in a PC at the same time. Using the extended memory requires modified software; Lotus has announced new versions of 1-2-3 and Symphony which can use the extended memory and also incorporate added features.

While Intel and Lotus have released the first products under the Expanded Memory Specification, the specification is "available to other companies for development of other products compatible with the new memory standard".

JRAM-2

Tall Tree Systems recently announced the JRAM-2 board, again with a limit for each board of 2 Mbytes, but a total of eight

boards can be installed to give a maximum of 16 Mbytes. Obviously no PC has that many expansion slots on the motherboard, but an expansion chassis can fix that. JRAM-2 appears to be configured differently from the Aboveboard; at present it can extend the available memory for normal applications to 704 Kbytes and use the surplus memory as RAM drives, spoolers and so on. Transferring program files to a RAM disk can make some software fly!

Cattledogs, anyone?

The first applications of mainframes were in the scientific/defence/code-breaking areas. Later they moved to the commercial areas, and now very few businesses could compete without data processing. It's no surprise that business applications took precedence in the early days of micros, but the swing to the scientific/engineering area has started.

IBM in the United States recognised this, and prepared a catalogue of engineering and scientific programs available from non-IBM sources. Ranging from languages to architecture, engineering, graphics, project management and costing, the paperback lists each program, describes its functions, specifies the necessary hardware configuration, and gives vendor and pricing information. Stock numbers listed on the rear cover are 6024194 and GC34-0588-0. It should be available through the library in the IBM office in your state.

IBM Australia is not about to be upstaged by its American cousin. Last year a showcase for engineering and scientific users of microcomputers was held in Sydney, and a listing of scientific and engineering programs available in Australia has subsequently been prepared. It should be released in late 1985; contact the IBM library for a copy. □

Electronics Today
INTERNATIONAL

ONLY \$2.75
N.Z. \$3.50

Electronics Today is Australia's dynamic electronics monthly. It has more special features, new and exciting projects to build and a wealth of information on components, equipment and new technology. Regular features include Australia's top hi-fi reviews and news on communications and computing. Buy your copy now from your local newsagent.

Plus/4

Introducing Software That Comes With Its Own Built-In Computer



Word processing, electronic spreadsheet, graphic plotting and file management certainly need no introduction.

But a computer that has them all built-in certainly does.

You could easily say the built-in software alone is worth a lot more than the price.

But then again you could easily say the Commodore PLUS/4 computer alone is worth a lot more than the price. With 64K of memory, 60K fully usable, full size typewriter keyboard, four separate cursor keys, high resolution colour graphics, extended BASIC, split screen and windowing capabilities.

Turn on the power and judge for yourself. Write and edit letters, reports, papers and novels with the built-in wordprocessor. Do the books, the budgets, the projections, profit/loss

statements with the built-in spreadsheet. Draw circles, boxes, complex shapes, images and combine them with text with the graphics program. Collect, store, organize and retrieve information such as mailing lists, inventories, personal files, business files and recipes with the file management program.

Go from one program to another at the touch of a key. For not only are they built into the computer, they're built into each other. So, for example, in one document, you can go from words to numbers to graphs to names and addresses. In just a matter of moments.

The Commodore PLUS/4. The first new computer that doesn't have one new thing about it. It has four.

For further information contact your nearest Commodore Dealer.

 **commodore**
COMPUTER

Keeping up with you.

Commodore Business Machines Pty. Ltd. New South Wales: (02) 427 4888
Victoria/Tasmania/South Australia: (03) 429 9855 Western Australia: (09) 389 1266 Queensland/Northern Territory: (07) 393 0300

BMS/CC365

CLASSIFIEDS

For Sale

Commodore Bank Street Writer in original wrapping - \$50 for disks and manual. Phone (059) 665 270; Lilydale area.

VIC-20 Program Library

High-quality games, utilities, educational and miscellaneous programs available. Send SAE to Chris Groenhout, 25 Kerferd Street, Watson 2602, for a list.

ACT VIC-20 Bi-Monthly Magazine

Contains many interesting articles and programs — \$2 for a single issue, \$12 for a year's subscription. Write to Chris Groenh-

out, 25 Kerferd Street, Watson 2602.

IBM PC 256 Kbyte Memory Card

As new. Will sell for \$256. Write to 12 Monkman Street, Chapman 2611; or phone (062) 88 3404 ah.

Swap C64 Programs

C64 owner with 100 programs wants to swap. Send list and disk to G. Kleidon, Box 228, Emerald 4720. Ph (079) 823 925.

Wanted

Secondhand Apple or compatible for under \$700. Phone (054) 91 1686 ah; or write to Martin Wicks, 1 Carrie Street, Charton 3525.

Oric I

A new 48 Kbyte home computer, with all manuals, lots of software, leads and a new tape recorder — \$400. Phone Rod Greenland (067) 46 1430.

Wanted

Fax and RTTY modem and software for the Microbee. Assembled and tested for use by DX/SWL. Phone Joe on (059) 87 1167; or write to PO Box 235, Dromana 3936.

Microbee

With 32 Kbyte IC, a joystick, a Kaga monitor, all manuals, a cas-

sette player, Wordbee, BASIC, and other software — \$650. Contact Julian Bird in Kingsbury on (03) 470 3010.

Microbee Tape Copier

Backup M/C programs at 300/1200 baud, change auto-start, and create copies suitable for transfer to disk — \$9.20. J Arnold, 36 Victoria Street, Rooty Hill 2766.

VZ200/300 Modem

RS232 interface with software in ROM. Modem supports Bell 103/CCIT V.21 300 bps with auto-answer and telephone handset. Phone (03) 791 5850 ah.

Trans-NetTM: Create Fabulous Networking capabilities for your PC



Trans-Net is the most easy-to-use and low-cost local area network available for your IBM PC and PC-compatible personal computers. It allows you to interconnect your stand-alone PC's and bring you into a fabulous networking world.

• **Data Sharing:** Before Trans-Net, the only way to share data between PCs was to make copies of floppy disks and distribute them to the appropriate users. This was not only time consuming, but the copied information quickly became "old" as the original data was updated. Now your users can share up-to-the-minute data files via Trans-Net.

• **Peripheral Sharing:** Some high quality add-on peripherals — such as letter quality printers, plotters, hard disk systems and communication devices are too expensive to add to each personal computer in your company. By installing Trans-net in your facility, you can save quite a cost by sharing the expensive peripherals with all Trans-Net users.

• **Inter-Computer Communications:** The needs for your inter-computer communication within your office will be getting more and more important in the future. Before Trans-Net, there is no way for your personal computers to communicate or talk to each other.

• **Networking Transparency:** Trans-Net, with multi-tasking capability, is so advanced, most users won't even know they are utilizing the network. Network operation is so simple and so

rapid, users can immediately realise dramatic increases in productivity.

• **State-of-the-Art Simplicity:** RPTI not only created the most advanced PC Local Area Network, but a Local Area Network of elegant simplicity. Installation, for instance, takes only a few minutes per workstation. Best of all, Trans-Net networking software, all by menu driven, is so easy to use and flexible, that everyone can operate the Trans-Net local network within a few minutes.

OSBORNE

3rd Floor, 93 York St., Sydney,
N.S.W. 2000 Ph. 290 1122 Tlx. 70510

Going Dotty

While most of us struggle with our green-screen monitors, single disk drives and a pirated copy of 'Welcome', it's encouraging to know some BBC owners have moved beyond a state of penury. Only the other evening I heard the wailing of one plutocrat, complaining he was down to the last couple of Mbytes on his hard disk. Although able to ignore this crass behaviour, I revolted when, only a few moments later, he complained it was hardly worthwhile owning a high-res colour monitor because there were only eight colours to look at.

It's not true! A few moments spent juggling bits in the screen memory can produce variety resembling a paint manufacturer's colour card, *and* you get to choose the ridiculous names for the colours.

The technique creates a fifth colour in mode 1 by mixing two 'standard' colours. In this mode, each pixel is controlled by two bytes, enough to define which of four colours is displayed. By setting up alternate bytes to be one colour, with those in between another colour, an effect is created similar to that used in some types of colour printing, where the eye merges the adjoining dots so they appear to be a different colour from that of the individual dots.

The dot pattern giving this effect is POKEd into part of the screen memory (see line 60 in Listing 1). The dots are drawn in 'logical' colours 1 and 2, and reference squares of each 'actual' colour (0 to 3) are shown across the bottom of the screen. The numbers of the 'actual' colours in use are shown at the top of the screen, and by pressing a key you can step through every combination of the eight 'actual' colours available.

Some of the resulting colours are horrible, others particularly useful. To use them you'll need to write a utility which allows you to draw the dot pattern using cursor or joystick control, or adapt one of the fill routines which seem to be taking over some BBC specialist magazines in the United Kingdom.

Of course, all this POKEing is likely to upset second processors, so it's probably best to turn them off. Those who are rich enough to afford them will not mind asking their butler to reach around the back and throw the appropriate switch.

View Upgrades

Being pretty well fed up to the teeth with the dozens of bugs in my 1.5 version of

Acornsoft's 'View' word processor, I sent the ROM and \$30 to Barson Computers and within a few days View 2.1 arrived.

Interestingly, only the ROM was in the envelope. By reading between the lines after entering *HELPCMODE, I discovered I could now print a document without saving — a facility which is useful as long as important files aren't just printed and left to rot in RAM as the power fades away. There was also a new command, FOLD, which I was naive enough to assume would show you where to fold the printed sheets. (I never manage to get letters into envelopes first try, so this would, I thought, be a definite improvement.) Alas, I was wrong again ... and where was the documentation?

Now, I'm not averse to cost-cutting if it eventually benefits the customer, but to spend money on 'upgrading' software without providing any explanation of how it differs from previous versions is, to say the least, of very doubtful benefit to anyone except Telecom. Three lengthy phone calls to Melbourne, each of which entailed being put onto wrong extensions, elicited no information, but I was finally promised a summary of changes "if there was one around".

Seven weeks have passed and no information has arrived. Should I assume

there aren't any useful changes? I'm wondering why I parted with \$30 — many of the old, familiar bugs still remain and, as a bonus, the printer driver now gets lost if you use the NEW command. It's probably too much to ask for a debugged version of View within 12 months of the previous 'debugged' version, but is it too much to ask what FOLD does?

Electron Programs, Anyone?

Late in May the Victorian Education Department joined the rest of the country in accepting the BBC in its classrooms. To the surprise of many, the newer B+ (64 Kbyte) model of the Beeb was joined by the Electron. Fitted with an ADFS chip, this machine looks remarkably like a Beeb to a network. The chip, however, prevents the electron from using any software which requires PAGE to be set lower than about £1900, ruling out just about every decent piece of software yet written for the Beeb. Please write if you know of any programs that survive on the Electron — there are a lot of people who would like to use a machine of the Electron's price to do something educationally useful, apart from teaching programming.

Next month, I'll look at the ACK BASIC compiler and why you should think very carefully before buying one. □

```

10 REM COLOR MIXING IN MODE 1
20 REM Press ESCAPE to finish.
30 *TVO 1
40 MODE1
50 REM Poke the bit pattern intoscreen memory.
60 FORA=&3780 TO &7380 STEP4: !A%=&A5
SAA55A:NEXT
70 REM Draw reference color patches.
80 FOR A%=0 TO 3
90   GCOL0,A%
100  X%=A%*320
110  MOVEX%,0:MOVEX%+320,0:PLOTB5,X%,
160:PLOTB5,X%+320,160
120  NEXT
130 PRINTTAB(20,1)"Press any key.";
140 REM Step through every combination
150 REPEAT
160   FOR A=0 TO 7
170     VDU19,1,A;0;
180     FOR B=A TO 7
190       VDU19,2,B;0;
200       PRINTTAB(0,1);A;" ";B;
210       Z=GET
220       NEXT
230     NEXT
240   UNTIL 0
>

```

Figure 1.

Space Chase

Since starting this column I've received very little feedback. However, one users' group member did complain the columns don't go into enough detail, which is a valid comment, but within the space allowed it's difficult to delve very deeply into any one subject. This is why I refer to so many articles from other sources — I can't easily condense six pages of information into one!

This month I want to look at the Programmable Character Generator inside the Microbee and illustrate some methods of getting more out of this useful feature.

First try an experiment: write a simple BASIC program to load just one of the 128 PCG characters with your required shape and print this character to the screen. Check the amount of memory left before you start your program and after it's finished.

For my system, PRINT FRE(0) initially gave a figure of 30206 bytes free. After typing in a simple PCG shape I was left with only 30066 bytes free; it took 140 bytes to specify just one character. The DATA statement for the 16 data values took up 70 of these bytes because each data value — such as 255 — is stored as three ASCII numbers.

Obviously, if we're going to use lots of PCG characters our DATA statements are going to be rather long, and, even worse, it will take a while to load this information.

"There must be a better way," you say, and you're right. In fact, there are at least two much better ways to load your PCG characters into memory, and both of them rely on the use of one simple machine code function — the LDIR assembly method.

LDIR (which stands for load, decrement, increment and repeat) will load a block of data of almost any length into another area of memory. You can load all 128 PCG characters into their RAM from your program in less than 1/50th of a second, and each character takes only 16 bytes of memory, with an overhead of another 13 bytes for the machine code. You can even have several data blocks for different sets of characters and load different character

"There must be a better way," you say, and you're right. In fact, there are at least two much better ways to load your PCG characters into memory, and both of them rely on the use of one simple machine code function — the LDIR assembly method.

sets into the PCG as required. This gives virtually unlimited PCG characters (although only 128 can be used at one time), and is the method used in the Austeconomy game.

Having decided to use this much better method, we have to decide where to load our PCG data. The first method I used relies on fitting all the data into BASIC program lines while ensuring the BASIC program itself never sees the data during the running of the program (to do so would cause more error messages than I could count). Hiding your machine code behind a REM statement does work, but can cause problems since BASIC apparently still reads the line and gets very confused if it reads a control code (a data value less than 31) within the line.

A Better Method

A better method is to start your program with line 1 and make the first instruction in that line a GOTO 100. After your colon following the first command you can put any code you like, because BASIC will never execute it. In addition, you have another 98 lines in which to put any code you require. You must be careful not to LIST these lines as they are expanded into non-

tokenised form when they are printed, and lines longer than 184 characters (the limit of the line buffer) cause problems by running over the end-of-line markers when they are restored to memory.

However, for programs requiring around eight to 28 PCG characters, I find this method the easiest to use.

A third method is to collect all the data bytes for your PCG characters, and put them together at the end of your BASIC program with your machine code loader at the start of the code sequence. This works very well, but you must alter your end-of-file pointer to accommodate the new section of code the first time you save the entire program.

The LDIR command is well documented in any books on Assembler, and since the values for the start of the block and the position it is moved to in the PCG will vary according to your program, you will have to work out your own code.

Designing PCG Characters

So far so good, but we still have to design your PCG characters. Here you will need some artistic skill and/or lots of patience. I've tried most of the graphic designer packages I can find, and the best seem to be modified versions (three characters wide) of Harry Purvis's original PCG program, PCG with Character, which appeared in *Your Computer* two years ago; and possibly Sketch Pad (from AT), mainly for geometric shapes. Actually, this latter program is probably much better than most, but the manual lets it down badly.

The Swedish Microbee agents have come up with two excellent PCG programs which will hopefully be on sale by the time you read this.

These programs seem to have everything you need in a graphics designer, and are accompanied by good documentation. One program is for BASIC users, while the other allows easy design of characters in the 80 by 24 screen format, which uses a character only 11 bytes high.

I've seen an advertisement for another PCG program in the pages of this magazine, but at this stage I have no feedback as to how good it is. □

The printer that makes your letters almost look engraved.



StarWriter™ by C. Itoh

Everything about a C. Itoh StarWriter daisy wheel printer is solid. The print. The reliability. And the company behind it. You can choose print speeds that range from 22 to 58 characters per second, with every line crisp and clear and straight. You can underline, print in boldface, use sub and superscripts. All C. Itoh

StarWriters are backed by a full warranty and Anitech's nationwide service organization. When you come, see how well they're built and how well they print, you'll know why C. Itoh StarWriters outshine all the rest.

Only at your Authorised C. Itoh dealer.

Distributed exclusively in Australia by:-



ADELAIDE: (08) 356 7333 **BRISBANE:** (07) 275 1766 **HOBART:** (002) 34 4511
MELBOURNE: (03) 795 9011 & 795 5111 **PERTH:** (09) 277 7000 & 277 1944
SYDNEY: (02) 648 1711 & 648 4088 **AUCKLAND:** (09) 444 2645

Programming the Function Keys

Both the 64 Users' Manual and the Programmers' Reference Guide lack any mention of how to use the function keys. Perhaps the authors thought it too obvious to mention, but since it's quite a common enquiry from new users, a brief explanation is in order.

The 64 has a 10-character keyboard buffer which is automatically updated 60 times a second. When any key is pressed its CBM-ASCII code is placed in the buffer. The ASCII codes for the function keys are from 133 to 140. Both the Users' Manual and the Reference Guide have ASCII and CHR\$ tables at the back which detail the codes for all keys, including the function keys.

You can use the BASIC GET statement to read the first character in the queue in a way a program can handle it — GET AS will read the character and call it AS. AS is a string variable and can be easily tested to see if it's one of the characters you're looking for. For example:

```
10 GET AS:IF AS=" " THEN 10
20 IF AS=CHR$(133) THEN 40
30 GOTO10
40 PRINT " F1 WAS PRESSED ":STOP
```

Line 10 gets a character from the buffer; if no key is pressed it will loop back and wait for another one to be pressed.

Line 20 tests for the F1 character and branches if successful.

Line 30 is reached only if the key pressed was not F1. It loops back to wait for another selection. This program will loop indefinitely until F1 is pressed.

If you wanted to test for more than one function key you could insert more lines between 20 and 30. You could also use one or more ON ... GOTO statements; for example:

```
20 ON- (AS="<F1>") -2* (AS="<F3>")
-3* (AS="<F4>") GOTO 40,50,60
```

When typing this, note that <F1> means press F1, not '<' 'F1' '>'. When you press a function key while in quote mode you see a reversed graphic symbol appear. This has the same effect as testing for the CHR\$() values, but makes a more compact code.

After determining which F key was pressed it's simply a matter of branching to your appropriate routine. It's up to you to work out what you want it to do.

The function keys can also be programmed under machine code; this is the only way to make them work in direct mode. The DOS 5.1 wedge uses this technique, as do the Plus-4 and C-16. By intercepting the keyboard deciphering routine (CHRGET at

115-138 on the 64), ML programmers can catch the F keys before the regular BASIC has a chance to register them. It's a neat trick, but one which requires a good deal of ML experience to pull off. Machine language enthusiasts will find the DOS 5.1 wedge techniques worthy of examination.

Unclosed Disk Files

After mentioning the 1541's reliability last month, several irate readers rang me to relate horror stories about how other files on their disk had been corrupted when using the '@SAVE' (save and replace) command.

The problems weren't caused by the '@SAVE' command, nor was there any bug in the 1541. The trouble was caused by the presence of unclosed files on the disk — something we should all avoid. The 1541 manual warns of the dangers of not properly closing files, but doesn't hint at the scale of potential disaster.

Unclosed files are usually caused by faults in your programming. You may have forgotten to use the CLOSE command after writing to a file, or perhaps a bug in the code meant the CLOSE command was never executed. Other causes can be power failures while writing to disk, or pressing the STOP key or removing a disk while the drive is still writing.

You can detect unclosed files on your disk by LISTing the directory. These bad files are marked by an asterisk after their filename. Do *not* attempt to scratch them or write or save to disk while they are present.

Unclosed files confuse the disk's BAM (block availability map). The BAM is the key used by the DOS to determine which blocks are free and which are not, and scratching or writing files while the BAM is confused can lead to unpredictable results, including corruption of data or programs.

There's a simple fix — the Validate command.

OPEN 15,8,15:PRINT#15,"V":CLOSE15 (or >V using the wedge). After performing a Validate check the directory again; there shouldn't be an asterisk in sight and your disk will be safe once again. Unfortunately Validate won't repair any damage that may have already been done to your other files, so you should make it a practice to regularly check your disks for unclosed files.

1 Mbyte Drives

Commodore is currently selling its 1001 1 Mbyte drive for an incredible \$299. On a bytes per buck basis this represents asto-

nishing value, especially compared with what non-Commodore users have to pay for similar storage capacity. Both the 1001 and its dual-drive equivalent (the 2 Mbyte 8250 at \$1350) use the parallel IEEE standard for data transfer. This requires a special interface but is at least 10 times quicker than the system used on the 1541.

Although the 1001 can't read or write to 1541 disks, its combination of fast access and storage capacity makes it ideal for database applications. Database programs which support IEEE really sing (if you don't believe me, check out Pittwater Distributors' Electronic Card File on a 1001). One national video chain is using a 64 coupled to a 1001 in each of its outlets to maintain cassette rental records — at less than one third of the cost of so-called 'business computer' alternatives.

Leading Edge IEEE Interface

There are many IEEE interfaces on the market, ranging from \$75 to \$250. Some are suspect, causing inexplicable problems when you least expect them. Others use switching techniques to cheat, providing a pseudo IEEE without the full speed benefits. The best interface I've come across is the Leading Edge, and it's made right here in Australia.

Leading Edge comes in the form of a cartridge plus a dual ROM board. Having a dual ROM makes it very easy to convert your computer back into a standard 64; you simply flick a switch. The Edge can be ordered in various forms, supporting just about every combination of output devices you can imagine. There's even a version which supports both IEEE and the Commodore serial bus at the same time; using it you could simultaneously run a 1541, a 1001 (and/or 8250) and a Commodore printer. Other options allow you to use a Centronics printer or the RS232 port.

The Edge was chosen by the video chain I mentioned earlier and is also in use on the RCOM BBS. Sysop Simon Finch waxes lyrical about it, and says his main joy has been from a programmer's point of view (he writes his own BBS software); because the Leading Edge is fully transparent, programmers aren't required to use any special POKes or SYS commands when switching from an IEEE to a serial one drive.

For further information contact Leading Edge, PO Box 182, Tuart Hill 6060; (09) 445 2152.

Leading Edge can also supply a 1001 single-drive backup program — something most 1001 users will find very useful. □

Macintosh Notebook: Macpaint

John Heilborn

Prentice-Hall, \$33.95

A hands-on guide to both the new and old versions of Macpaint, written in very simple language. Each step is explained in detail, with accompanying sketches and bold crossheads to assist the novice. Every chapter has an explanatory heading, a list of contents and a brief synopsis. The book is written and typeset on the Macintosh and Imagewriter, so text and illustrations look just like those you can create on the computer screen.

The Word Processing Handbook

Katherine Aschner

Pan, \$8.95

An American step-by-step 'how to', which has been revised for the UK and Australian markets, *The Word Processing Handbook* advises what machines are available, their functions, how to choose the right system, the pitfalls to watch for and what kind of staff training is needed — and it's all presented in a straightforward style with easy-to-read print.

Electron Assembly Language

Bruce Smith

Shiva (ANZ), \$7.95

A guide to machine code programming, this book discusses binary to decimal to hexadecimal conversion, mnemonics, the accumulator, index registers, assembly delimiters, the status register and carry flag, addressing modes, addressing, subtraction, multiplication and division in machine code, the stack and how to use it, subroutines — assembler equivalents of BASIC, GOSUB and RETURN — and machine operating system routines and their uses.

Appendices giving ASCII codes, assembly language equivalents of BASIC statements and the instruction set and opcodes for the 6502 are included. An Electron utilities tape is also available.

Software For Microcomputers — A Businessman's Guide

Deloitte Haskins & Sells, \$12.95

The third in a series of books on microcomputers written specially for the Australian market, the guide emphasises two golden rules: select your software before

choosing your hardware, and buy the best-quality software in preference to poorer quality, even if it's cheaper.

Assembly Language Programming for the Acorn Electron

Ian Birnbaum

Macmillan, \$21.95

A book with exercises and full solutions, backed up by an accompanying cassette which contains all relevant listings and two additional utility programs.

The Complete VIC ROM Disassembly

Peter Gerrard, Kevin Bergin

Duckworth (ANZ), \$19.50

Intended for the serious programmer, this book includes fundamental memory maps, memory architecture maps, the disassembly itself and the complete 6510 machine code instruction set.

The Penguin Book of Commodore 64 Sprite Graphics

Tony Atkinson

Penguin, \$14.95

A book for beginners who want to create their own animated graphics quickly and easily on the Commodore 64. The explanations in each of the six chapters are brief, designed for immediate 'doing'. Five appendices provide further detail for those who want to understand the theory behind sprite graphics. We're sorry to say we thought the full impact of 'the magic of sprites' was lost in the black-and-white presentation of this book.

Step By Step Programming the Sega SC3000 — A Friendly Introduction for Beginners

Philip O'Carroll

Penguin, \$14.95

A 'jump in boots and all' guide to 46 ready-to-use programs, this book enables beginners to get started quickly. Create your own games with sound, colour and animated graphics.

Sixty Programs for the Dragon 32

Sixty Programs for the Atari

400/600XL/800XL

Sixty Programs for the VIC-20

Robert Erskine and Humphrey

Walwyn, Paul Stanley and Michael Bews

Pan, \$14.95 each

Toolkits for constructing efficient programs, and the weapons required to disassemble them and annihilate the bugs. Accompanying texts explain the use and mechanics of each utility.

The Power of Financial Calculations for 1-2-3

Robert Williams

Prentice-Hall, \$23.95

Presents practical solutions to everyday problems facing business people. The procedures necessary to perform each exercise are given to the reader step by step.

The Australian Guide to Lotus 1-2-3

Bob Thompson

Computer Tutor, \$14.95

This ring-bound guide is designed to give the novice microcomputer user an introduction to Lotus 1-2-3, with integrated practical exercises to be performed on the IBM PC.

The Bewildered Parents' Guide To Computer Programming

Shayne Micchia

Pitman, \$12.95

Among the many positive aspects of this book are its cover, Lyn Stocks' cute illustrations, the easy-to-read type and Ms Micchia's simple and direct style. The latter is evident from the first chapter: "... computers are not intelligent creatures. In fact they are quite dumb." Computer jargon is avoided and each of the 17 chapters is followed by a summary, as well as quizzes and assignments designed to prove to parents that, "You cannot damage your computer in any way by pressing a key or giving a wrong instruction."

The Regis Touch

Regis McKenna

Addison-Wesley Publishing

Company, \$22.95

Hailed as "million dollar advice from America's top marketing consultant", the contents of this hardback are designed to teach us how to make money out of the 'computer age'.

The IBM Personal Computer for Beginners

Seamus Dunn, Valerie Morgan

Prentice-Hall, \$24.50

Eleven chapters, a set of appendices and reference tables provide a comprehensive introduction to the IBM PC for beginners with neither computing experience nor outstanding mathematical skill.

A Glossary of Computer Terms

Edited by The British Computer

Society Schools Committee Glossary

Working Party

Cambridge University Press,

\$4.75

As the title suggests, this is a glossary of common computing terms explained in simple language. Fifteen sections cover a wide variety of topics, such as programming languages, personnel, architecture, applications, storage systems and software. The reader is guided to other related terms where applicable, and a complete index is provided.

Microcomputer Art

Ross Edwards

Prentice-Hall, \$19.95

A book for general application with any small personal computer, *Microcomputer Art* shows how to simulate the motion of a 'geometric pen' or 'geometric lathe' on the computer screen.

Pitman's First Book Of Amstrad Games

Hugh Cameron, Danny Olesch

Pitman, \$12.95

An introduction to writing programs for the Amstrad series of micros, this book incorporates a number of program listings ranging from games to a database program. Each listing introduces a new basic programming technique, which is explained in detail in the accompanying notes.

Tandy Educational Software Sourcebook

Compiled by Karel Davey

Tandy, \$14.95

A collection of more than 600 software products for Tandy's Color 1014 and Model 100 classroom computers. Programs are indexed according to which subject they could be used in. Their descriptions include: the medium on which they are recorded, what instructional techniques they employ, what system configuration they require, the intended user level, price and distributor.



Bit By Bit — An Illustrated History Of Computers

UNTIL RECENTLY, hardware left me cold, but after reading *Bit By Bit*, I regard computers in an entirely new light.

Stan Augarten's approach to his subject is summed up in the preface: "No machine, no matter how extraordinary, is as interesting as its maker." True to this stated belief, the author enlivens his discussion of historically significant machines with snippets of gossip and interesting anecdotes about the people involved in their development; for example, he writes, "Flint was a colourful figure, an international wheeler-dealer who earned his first million selling munitions in Latin America and who was popularly known, in the catchy if exaggerated phrase of a Chicago reporter, as 'the father of all trusts'."

Divided into nine chapters, each introduced by a relevant quote from someone of note in the industry, the book charts the

history of the computer in a straightforward, colloquial style, which even the most unscientific dummy can understand. Augarten's tongue-in-cheek tone renders *Bit By Bit* quite digestible; I could identify with a quote from CBS commentator, Edward R. Murrow, "The trouble with machines is people."

Text in *Bit By Bit* is printed in bold, easy-to-read type, and this paperback is just the right size for bedtime reading (although it won't cure insomnia).

As the title suggests, illustrations are abundant and the old family photos and advertising copy would hold particular interest for historians. I would have liked to see more colour in a general-interest book such as this, but ...

Chapter 6, which describes the rise of the IBM empire, is perhaps the most gripping. Augarten's assertion that, "To a large

degree ... IBM is the computer industry, and almost every other computer company in the world swims in its ocean" is supported visually by a table of the company's phenomenal growth since World War II.

Bit By Bit is well organised; its 324 pages include an index, a bibliography and notes, a chronology, an epilogue and an appendix.

Always down-to-earth, *Bit By Bit* fittingly concludes: "Yet, no matter how smart we manage to make it, the computer will never be a panacea. It is a tool, a fabulous tool, but nothing more, and we shouldn't invest it with all our hopes and dreams for the future." I like that. □

Author: Stan Augarten

Publisher: Unwin Paperbacks

Distributor: George Allen & Unwin

Price: \$19.95 rrp

HERE TODAY HERE TOMORROW

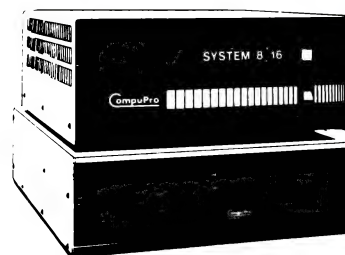
System 816 features incredible storage capacity, the flexibility to handle a large variety of applications, and the speed to get the job done fast. And you can choose from more than 3,000 CP/M® 8- or 16-bit programs as your needs grow. With the ability to expand from single- to multi-user, network up to 255 systems, and upgrade as technology advances, this computer stands the test of time.

As your local Full Service CompuPro System Center, we'll tailor a computer system to fit *your* needs. And the service continues into tomorrow with CompuPro's full year warranty.

The CompuPro System 816 ... just as essential tomorrow as it is today.

The Essential Computer™

CompuPro



CompuPro's System 816™ ...
the computer that increases
your productivity today ...
and tomorrow.

AUTOMATION STATHAM Pty. Ltd.

47 BIRCH STREET, BANKSTOWN, NSW, 2200.

(02)709-4144 TLXAA 73316

VIC: Vantage Applications Systems
852 Canterbury Road, Box Hill South, 3128
(03) 890-0326

1984 CompuPro System 816 and The Essential Computer are trademarks
of CompuPro. CP/M is a registered trademark of Digital Research, Inc. American is a trademark of Xerox Corp.

**New
Release!**

PC to go!



Cat X-5500

The real PC compatible — Toshiba T1100 portable

Here it is: the sensational star of the Data '85 show — the one everyone wants but only we have been able to get!

So small, it will fit into a briefcase. So powerful, it has 256K memory in-built (512K optional). So compatible, it will run all the popular IBM PC programs (such as Lotus, Symphony, dBase, Framework, Flight Simulator, etc).

Yes, this amazing computer measures just 31 × 6.6 × 30.5cm. That's tiny!

And it weighs just 4.1kg. That's light. Yet it gives you the same computing power as the others. That's convenience!

And it comes complete with an in-built 720K disk drive. Ni Cad Batteries (for up to 8 hours portable use). An 80 character, 25 line LCD display PLUS an RGB monitor port for full colour graphics. Parallel printer port. AC adaptor/battery charger. And so much more!

Strictly limited stock

Because of the Toshiba T1100's world-wide popularity, very limited quantities are available in Australia. We have obtained these — but there aren't too many to go around. So hurry in — or we'll guarantee a long, long wait!

PLUS! ACCESS FOUR software package.

Yes, from the developers of 'Open Access' comes the very latest software package: Access Four. With a quality text editor. Magnificent spreadsheet. 3D Graphics. Information Manager. Plus 'pop-up' electronic desk including Time Zone Clock. Stopwatch. Business Card File. Appointments diary/calendar. Everything the modern day business person needs to organise their day. And it's all there: right in front of you in your Toshiba T1100: only from Dick Smith Electronics.

Commercial leasing or AGC finance available to approved customers.

**All this for
only \$2995
SAVE \$700!***

INCLUDES POWER SUPPLY, DOS, MANUALS AND FULL WARRANTY!

*Toshiba's T1100 (only) recommended retail \$2995. DSE's price includes Access Four & all these 'extras'

Dick Smith Electronics Pty Ltd

COMPUTERSTOP



Want to know more about T1100? Send for your FREE information pack. It's obligation free: no salesman will call.

Name:

Address:

Postcode:

Drop into any Dick Smith Electronics store or send to DSXpress (PO Box 321, North Ryde NSW 2113).

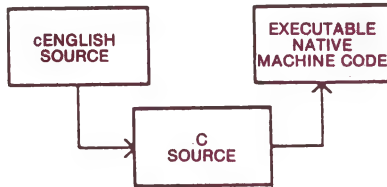
Your one stop computer shop at your nearest Dick Smith Electronics centre.



cENGLISH. The C Generation Language.

What is cENGLISH? is a comprehensive fourth generation procedural language based on dBASE II syntax. It is portable to a wide range of micros and minis. The language features user-transparent interfaces to a wide range of popular C compilers, operating systems, and data base managers.

How is portability achieved? cENGLISH through its compiler interface translates cENGLISH into documented C source and uses a host C compiler to produce native machine code.



C source can be embedded in cENGLISH source.

Differences in the operating system and data base manager are handled by the runtime libraries. The result is that cENGLISH source can be compiled without modification on any micro or mini configuration supporting cENGLISH.

What about performance? cENGLISH executes FAST, just like any compiled C program.

How easy is cENGLISH to use? While cENGLISH is a powerful high level language that can accommodate complex software development, it remains simple and straightforward to use.

Call or write for availability of cENGLISH for the following configurations —

Compilers:

Standard O/S compilers: Lattice C™ for

MS/DOS™ Operating systems:

UNIX,™ UNIX-like, MS/DOS,™ Coherent,™ VMS™

Data Base Managers:

C-ISAM™ and INFORMIX,™ UNIFY,™ ORACLE,™

PHACT,™ Logix™

Attention MS/DOS users. Demo version and special introductory offer available for IBM PC, XT, AT, and other MS/DOS systems. eg. NEC APCIII, Olivetti M24. Requirements: 256K, hard disk or two floppy disk drives, and MS/DOS 2.1 or higher.

Also available: the dBASE II to cLINE/cENGLISH Converter to ease the conversion task. Up to 95% of dBASE II code is automatically converted to cLINE/cENGLISH. It requires about the same effort as converting to dBASE III and provides many more benefits.

Lattice C, MS/DOS, UNIX, Coherent, VMS, C-ISAM, INFORMIX, UNIFY, ORACLE, PHACT, Logix dBASEII, dBASEIII are Trademarks of their respective companies.

cLINE™
Inc.

SAMPLE cENGLISH PROGRAM

IDENTIFICATIONS

```

MODULE Mininame
AUTHOR: bcs
DATE: 8/29/84
REMARKS: Sample cENGLISH program that adds first
names to a file
END IDENTIFICATIONS
  
```

GLOBALS

```

FIXED LENGTH 1 ans
FIXED LENGTH 15 Fname
END GLOBALS
  
```

MAIN PROGRAM

```

BEGIN
CLEAR SCREEN
SET ECHO OFF
  
```

```

USE "NAMES"
VIEW BY "ID__FNAME" ASCENDING
  
```

```

AT 23, 1 SAY "Add a record? Y or N"
AT 23, 25 ENTER ans USING "!"
  
```

```

WHILE ans EQ "Y"
CLEAR GETS
AT 6, 1 SAY "Enter first name"
AT 6, 20 GET Fname
READ SCREEN
  
```

```

INSERT
Fname = Fname
END INSERT
  
```

```

AT 12, 10 SAY "Welcome to cENGLISH", & Fname
WAIT
AT 14, 10 SAY "HIT ANY KEY TO CONTINUE"
STORE " " TO ans
STORE " " TO Fname
AT 23, 1 SAY "Add another record? Y or N"
AT 23, 30 ENTER ans USING "!"
CLEAR ROW 1 THRU 23
  
```

```

END WHILE
  
```

```

AT 12, 10 SAY "That's all for now!"
UNUSE "NAMES"
SET ECHO ON
  
```

```

END PROGRAM
  
```

I'd like to know more about cENGLISH.
Please send further information.

Your Name _____

Company _____

Address _____

City _____

Title _____

Telephone _____

Check one: ☐ End User ☐ Dealer

Award Software Australia
90 King Street,
Perth W.A. 6000
(09) 322 6654
Tlx: 92547
YC10/85

One of the best places to get information and help with a particular machine is through a computer user group or club. Such little pockets of wisdom are scattered throughout Australia, as you can see from this listing which we'll be publishing every couple of months.

Australian Capital Territory

ACT Apple Users' Group, Ernie Kruck, GPO Box 1231, Canberra City 2601, (062) 86 1208.

ACT Micro 80 Users' Group, Bill Cushing, 10 Urambi Village, Kambah 2902, (062) 31 3630.

ACT PC Users' Group, Nick Hammond, PO Box 188, Parkes 2600. Meetings last Monday each month at Reid Tafe, 8.00 onwards. (062) 86 1102.

ACT VIC-20 Users' Association, Chris Groenhout, 25 Kerferd St, Watson 2602. Meetings first Monday each month at Boys' Grammar Scout Hall, Red Hill, 7.30 onwards. (062) 41 2316.

ATARI, Chris McEwan, co-ordinator, ACTARI, PO Box E112, Canberra 2600, (062) 88 7861.

Apple User Group (ACT), Jeff Brock, 1 Buckley Circuit, Kambah 2902, (062) 31 3630.

Australian ZX80 Users' Association (AZUA), David Vernon, 50 Waller Crescent, Campbell 2601; for ZX81, ZX Spectrum and Sinclair QL owners. Meets on the last Wednesday of every month at the Woden Valley High School library at 7.30 pm.

Canberra ACT Sirius User Group, Jim Bland, (062) 81 2824, (062) 81 2832.

Canberra Compucolor Club (CCC), Meets 7.30 on first Sunday of every month at the offices of Digital Equipment, 28 Lonsdale Street, Braddon ACT.

Canberra Microbee Users' Group, Meets 7.30 pm on first Tues of every month at Woden Valley High School Library, Bill Horsfall (062) 58 3193. PO Box 227, Weston Creek, ACT 2611.

Canberra Micro-80 User Group, Milt Cottey, 33 Crawford Cres, Flynn 2615; meetings third Monday each month, 7.30 pm, in the small theatre, Reid TAFE, for System 80, TRS80 and so on. (062) 58 8822.

Canberra NEC Users' Group, Mal Smith, PO Box 173, Belconnen 2616; meets first Tuesday each month at Main Conference Room, CSIRO Headquarters, Limestone Avenue, at 7.30. (062) 54 1614.

Canberra Osborne Group, c/o Geoff Cohen, PO Box 136, Kippax 2615, (062) 54 1608.

Kaypro User's Group (ACTKUG), meets on the third Thursday of each month from 6.30 pm in the J Block theatre, Canberra TAFE, Constitution Avenue, Reid. Contact Des Ireland, on (062) 47 5330.

Micsig, Registrar, PO Box 446, Canberra 2601.

PC Users' Group (for users of IBM PC and similar machines); meets on the last Monday of each month at 8 pm in the main theatre, Building J, Canberra TAFE. Contact address: PO Box E188, Parkes, ACT 2600.

Sirius/Apricot User Group, M J Sim, 253 Hindmarsh Drive, Rivett 2611; meetings 7.30 pm third Tuesday each month, 88 Wollongong Street, Fyshwick 2609.

New South Wales

Albury Wodonga Apple User's Group, Jenny Scott (secretary), (060) 24 3225 or Don McLennan (president), (060) 46 028; meets second Wednesday every month at Wodonga High School at 7.30 pm.

Albury-Wodonga District Microbee User Group, Eric Eulenstein, 202 Kooba St, Albury 2640, (060) 25 1601.

APF Users' Group, Norm McMahon, 288 Kissing Point Road, Turramurra 2074, (02) 44 2645.

Apple Team Australia, 5 Walpole Place, Wahroonga 2076; (02) 48 1018.

Apple Users' Disk Exchange Club, Phillip Donnadieu, Flat 1 8-10 Lancelot Street, Allawah 2218; (02) 579 4547.

Apple Users' Group, Colin Rutherford, PO Box 505, Bankstown 2200; meets 6.30 pm second Monday of each month (Tuesday after public holidays) at Sydney Grammar School, Stanley Street, Sydney. (02) 520 0926.

Atari Computer Enthusiasts, Tony Reeve, PO Box 4514, Sydney 2001.

Ausborne, The Secretary, PO Box C530 Clarence Street, Sydney 2001; meetings third Wednesday each month at 6.30 pm in the North Shore Council Chambers, Cnr Miller and McLaren Streets, North Sydney 2060. (02) 95 5378.

Ausbug, Stephen Ford, PO Box 62, Londonderry 2753.

BBC Educational Users' Group of NSW, Dick Cleary, PO Box 939, Darlinghurst 2010;

meets 7.30 pm third Wednesday of each month at various locations.

Blue Mountains Microbee User Group, Roger Cooper (president), (047) 58 7238.

Blue Mountains Computer User's Group, Eric Lindsay (secretary), 25 Reserve Avenue, Blaxland 2774, (047) 51 2632.

Bondwell User's Group, Ray Richards, 7/39 Ross Street, North Parramatta 2151, (02) 683 3940.

Broken Hill Microbee Users' Group, Peter Cotter, 533 Radium Street, Broken Hill 2880, (080) 88 1621.

Casio PB 700 User Group, Terry Gill, 35A Kent Street, Regent Park 2143, (02) 644 4115.

Central Coast Apple Users' Group, C W Lee, 662 The Entrance Road, Wamberal 2260; meetings first Tuesday each month at the Niagara Park Public School from 7.30 pm. (043) 84 3419.

Central Coast Microbee Club, Max Maughen, PO Box 36, Ettalong Beach 2257; first Tuesday every month at Applied Technology, West Gosford. (043) 24 2711.

Compucolor Users' Group, Tony Lee, 52 Cowan Road, St. Ives 2075, phone (02) 449 8824.

Cooma Microbee User Group, Phil Zikan, PO Box 92 Cooma 2630, (064) 82 3315; meets on the second Friday of the month.

Cumberland Computer User Group, S O'Neil, (02) 682 3851.

Dataflex User Group, Roger Walker, (02) 699 3877.

dBase Users' Group, PO Box 297, Neutral Bay Junction 2089; meets every second Tuesday each month at the Cowper Room, St. Andrew's House, corner Bathurst and Kent Sts, Sydney.

DEC Personal Computer Special Interest Group, Marion Rhydderch, DEC Australia, Northern Tower, Chatswood Plaza, Railway Street, Chatswood 2067, (02) 412 5252.

Dubbo and District Microbee Users' Group, Coralie Taylor, 18 Cunningham Street, Dubbo 2830; meets fourth Wednesday each month at 7.30 pm in the Dubbo High School Computer Room.

Griffith Computer Association, Ron Gauci, PO Box 425, Griffith 2680, (069) 62 5877.

Griffith Microbee User's Group, Ingmar Meins, (069) 62 3074; meets the fourth Monday of each month at Neighbourhood House at 7.30 pm.

Hawkesbury Apple User Group, Secretary Steve Bennett; meets fourth Monday each month at 7.30 pm, Richmond Primary School, (045) 78 2195.

Hawkesbury Commodore Computer Club, Richard Farrell, 12 Inverary Drive, Kurmond 2757; meets fourth Tuesday of each month at 7.30 pm at Neighbourhood Centre; West Market Street, Richmond 2753.

Hawkesbury Microbee Computer Club, Bruce Rennie, 6 Warks Road, Kurrajong Heights 2758; workshops 7.00 pm third

CLUB FILE

Friday, and general meetings 7.30 pm first Friday of each month in the Microbee Network Room, Library Building, Richmond High School, Cnr Penrith and Lennox Streets, Richmond 2753. (045) 67 7329. **Hitachi/6809 User Group**, meets on the first Saturday of each month, at 2 pm; contact Robert Lohr on (02) 662 4150, after 6 pm for locations.

HP Desktop Computer Users' Group, Dr R W Harris, CSIRO Division of Mineral Physics, PMB 7, Sutherland 2232, (02) 543 3460.

Hunter Users' Group — All Microcomputers, Secretary, PO Box 39, Broadmeadow 2298; meets on the second Wednesday of each month in Room 308, Building W, University of Newcastle, at 7.45 pm. Membership is primarily Apple II oriented, but anyone with interest in micros welcome.

IBM User Group, Ron Pollack (president), PO Box 501, Sydney 2001; meets third Monday of every month on the 11th floor, 50 Bridge Street, Sydney in the Price-Waterhouse seminar rooms at 5.30 pm. (02) 290 3655.

Illawarra IBM PC Club — All IBM compatibles, Dick Adams (secretary), c/o John Lysaght Ltd, Delivery Code 29, PO Box 77, Port Kembla 2505; (042) 75 6721.

Illawarra Microbee Computer Club, Ronald Read, PO Box 271, Warrawong 2502; meets every 4th Monday at 7.30 pm, Wollongong Institute of Education, Northfield Ave, Gwynneville; (042) 71 2384.

Illawarra Super 80 Users' Group, Jim O'Grady, Chairman, PO Box 1775, Wollongong 2500.

Macarthur Computer Association, J Napier, 23 Athel Tree Crescent, Bradbury 2560; meets first Monday each month at Airds High School, Briar Road, Campbelltown 2560, at 7.30 pm each month; all machines are catered for. (046) 25 2055.

Macquarie Microbee Users' Group, Brian Thompson; meetings first Monday each month at Denistone East Primary School at 7.30 pm. (02) 85 1659 after hours.

MEGS (Microcomputer Enthusiasts' Group), John Whitlock, PO Box 1309, Chatswood 2067; meetings third Monday each month at rear of St Andrew's Presbyterian Church, 37 Anderson Street, Chatswood 2067, (02) 638 1142.

Microbee Users' Club (Broken Hill), Peter Cotter, 533 Radium Street, Broken Hill 2880, (080) 88 1621.

Newcastle Microbee Users' Group, Lee Osman, 12 Cleverton Close, Warners Bay 2282, (049) 48 8813.

Newcastle Microcomputer Club, Angus Bliss, PO Box 293, Hamilton 2303; meetings 7.30 pm second and fourth Monday each month at Room G12, Physics Building, Newcastle Uni. (049) 67 2433. **NSW Primary School Microbee Users'**

Group, Mr Peter Stretton, c/- Hunters Hill Primary School, Alexandra Street, Hunters Hill 2110.

NSW 6800 Users' Group, 27 Georgina Avenue, Keiraville 2500.

Northern Beaches VIC User Group, E. Tuxford, 161 Barrenjoey Road, Newport 2106, (02) 997 2467.

Northern NSW MICC Chapter, Alen Hartley, Dundurrabin via Dorrigo 2433, (066) 57 8160.

Open Access User Group, Steve Cook, Advanced Data Technology Pty Ltd, 1 Terrell Avenue, Wahroonga 2076; (02) 48 0511.

OSI Users' Group, Nigel Bisset, (02) 411 7142.

Pocket Computer Users' Club, George Antonijevic; for those interested in pocket computers, whatever the brand. Meetings held on the first Wednesday of each month at 7.30 pm at the Woodstock Community Centre, Church St, Burwood 2134, (02) 683 4296.

Sega Users' Club, Jim Robinson — Penrith branch, (047) 30 1834; Jeff Wilson — Parramatta branch, (02) 684 4128.

Sirius/Apricot User Group, Wayne Collom, Barson Computers; meets first Tuesday each month at 6.30 pm, Unit D, 55 Talavera Road, North Ryde 2113; (02) 888 9444.

Sorcerer Users' Group, PO Box E162, St James 2000; meetings third Friday each month at 8.00 pm in Greenwich Community Hall, Greenwich Road, Greenwich 2065.

Southern Districts Commodore Users' Group, Lex Toms, 3 Lucille Crescent, Casula 2170; meetings first and third Wednesdays each month, API Hall, Currajong Road, Prestons 2170. (02) 602 8691.

Sutherland Super 80 Group, Jim Traeger, (02) 525 2018.

Sydcom 64 (C64 User Group), Philip Dean, GPO Box 1542, Sydney 2001; meets on the second Wednesday of each month at the Abraham Mott Hall, Argyle Place, Miller's Point.

Sydney Forth Group, Peter Tregeagle, 10 Binda Road, Yowie Bay 2228; meets second Friday of each month at 7.00 pm in the John Goodsell Building, UNSW room LG19. (02) 524 7490.

Sydney Kaypro Users' Group, Hans Schneider, C/O Dr H. Schneider, Geography Department, UNSW, PO Box 1, Kensington 2003; meetings second Tuesday of each month, 8.00 pm, Burwood RSL Club. (02) 697 4400 (w) or (02) 309 2961 (h).

Sydney Lotus 1-2-3 User Group, Ron Pollak, (02) 29 5316.

Sydney Microbee Users' Club, Colin Tringham, PO Box C233, Clarence St, Sydney 2000; meetings third Saturday each month 1-5 pm, Strathfield Girls' High School, (02) 92 6408.

Sydney Northside Apple Users' Group, Philip Webb, meets first Tuesday each month 6.30 to 8.30 pm, Willoughby Council Library, 411 Victoria Avenue, Chatswood 2067. (02) 419 3294.

Sydney TRS80 Users' Group, meetings second, third and fourth Saturday of each month at Botany. (02) 666 4716 bh.

TAG — The Access Group, Bob Dolton, PO Box 943, Orange 2800; for Access and Actrix users.

The Great Western Computer Users' Group Jim Graham, PO Box 210, Wentworthville 2145; (02) 636 9219. All micro users are welcome. A 40-minute beginner's session is held at the beginning of each meeting. The club meets on the first Tuesday of each month, at 8 pm.

The Morrow User Group Alan Stern, (02) 750 8274; meets on the fourth Wednesday of every month at the Woodstock Community Centre, Church Street, Burwood at 7.30 pm.

Western Sydney PC and Compatible User Group, Ben Sharif, (047) 36 4825; meets on the third Sunday of the month at 1.30 pm, 27 Cosgrove Crescent, Kingswood 2750.

TI Sydney Home Computer Users' Group, PO Box 149, Pennant Hills 2120.

Tuggerah Lakes Computer Users' Group, Frank James, 125 Woolana Avenue, Budgewoi 2262; meetings second Thursday each month at Old Primary School, Wyong, at 6.30 pm. (043) 907 339.

Wagga Microbee Users' Group, John Simmons, 47 Undurra Drive, Glenfield 2650; meetings first and third Tuesdays each month in the Tolland-Glenfield Neighbourhood Centre at 8.00 pm. (069) 31 1302.

Wizzard User Group, John Mifsod, 150 Bouganville Road, Blackett 2770, (02) 628 0801.

ZX-Spectrum Users' Club, Craig Kennedy, PO Box 466, Epping 2121.

Queensland

Adventure Club, Christine Ogden, 37 Samford Road, Leichhardt, Ipswich 4305; for all Adventure-type game players.

Adventure Special Interest Group, Ernie Sugrue, PO Box 594, Maryborough 4650.

Amstrad Postal Users' Group, Frank Elliot, 59 27th Avenue, Palm Beach 4221; a group for isolated Amstrad users — meets monthly by cassette.

Apple-Q — The Brisbane User Group, The Secretary, PO Box 721, South Brisbane 4101; meetings every third Sunday of month at Hooper Education Centre, Kuran Street, Wavell Heights 4012. Centre is open from 8.30 am till 4.30 pm; members encouraged to bring Apple along.

Australian Sirius Users' Group, PO Box 204, Chermerside 4032; looks after the needs of Sirius One and Victor 9000 computer users; (07) 350 2611.

BASIC User Group, Chris Lucey, Cranium Computers, 34 Lawless Street, Blackwater 4717.

Brisbane Medfly Users' Group, K J Walker, 120 Highgate Street, Coopers Plains 4108.
Brisbane Sinclair (Spectrum) Computer Club, V Lewis, 37 Samford Road, Ipswich 4305; meets third Sunday at Everton Park State High School, at 2.00 pm. (07) 355 7809.

Brisbane Super 80 Users' Group, Gary Gatfield, (07) 355 3173.

Brisbane Youth Computer Group, A Harrison, PO Box 396, Sunnybank 4109.

Cairns District Microbee Users' Group, Chas Eustance, 21 Marr Street, Edmonton 4869, (070) 55 4531.

Commodore Computer Users' Group Queensland, N Chambers (secretary), PO Box 274, Springwood 4127; (07) 808 2125.
Commodore Users' Group, John Egan, PO Box 274, Springwood 4127; for owners of Pet/CBM and VIC-20 machines. Meetings held on the first Tuesday of the month at 130 Petrie Terrace, Brisbane 4000. (07) 287 2705.

Computer Owners' Group, Betty Adcock, 42 Lucan Ave, Aspley 4034; meets second Wednesday each month, 7.45 pm; all kinds of computers are catered for. (07) 263 4268.

DEC Personal Computer Special Interest Group, see NSW entry.

Gold Coast Microbee User Group, Col McLaren, 1/100 Imperial Parade, Labrador 4215; meetings first Sunday each month, 3.00 pm, at the Southport High School. (075) 31 4610.

IREE Microcomputer Interest Group, N Wilson, PO Box 811, Albion 4010.

Mackay Microbee User Group, Geoff Gehring, PO Box 230, Mackay 4740, (079) 42 3214.

NEC User Group, David Clark, 18 Provence Street, MacGregor 4109, (07) 343 7680; meets on the first Friday of each month.

Osborne Users' Group of Queensland Uni, Glen McBride; meetings second Wednesday each month, open to all. (07) 870 1177.

Queensland CP/M Users, The Secretary, PO Box 1025, Milton 4064; meets on the last Sunday of each month at the University of Old, Civil Engineering Room 1.01 (off Staff House Road) from 1 pm.

Sega Users' Group, Robert Horkings, PO Box 148, Fortitude Valley 4006, (07) 52 5603; meetings first Saturday of each month, YMCA Hall at 1 pm.

Southport Commodore Computer Users Group, Bill Fitzpatrick, PO Box 790, Southport 4125, (075) 32 0061.

Superboard Users' Group, Ed Richardson, 146 York Street, Nundah 4012.

Tandy, Apple, Commodore User Group, Chris Lucey, 34 Lawless Street, Blackwater 4717.

The Microcomputer Society, The Secretary, PO Box 580, Fortitude Valley 4006; meetings are held on the second Friday of each month in the Old Town Hall, corner Vulture and Graham Streets, South Brisbane 4101. Meetings start at 7.30 pm; if main gate is closed use the back stairway.

Townsville Microbee User Group (TMUG), Mannie Van Rijswijk, PO Box 5751 MC, Townsville 4810; meetings 7.30 pm on second and fourth Mondays each month on the Ground Floor, St Margaret Mary's Secondary School, Crowle Street, Hermit Park 4812.

TRS80/System 80 Computer Group, Secretary, 16 Laver Street, Macgregor 4109; meets first Sunday each month at Lindum Hall, Lindum Street, Lindum 4178, at 2.00 pm. (07) 343 5771.

University of Queensland Osborne User's Group, Glen McBride (president) (07) 870 1177, or Richard Duczmal (treasurer) (07) 377 3139; meets on the second Wednesday of the month, in the Axon building on campus. Membership is open to both students and non-students.

VZ-200 Pacific Region Club, J D'Alton, 39 Agnes Street, Toowong 4066, (07) 371 3707.
ZX81 Club, P Carswell, 22 Braud Street, Bundaberg 4670.

South Australia

Adelaide Atari Computer Club (AACC), Secretary, PO Box 333, Norwood 5067; meets at Gilles Street Primary School, City, on first Monday (second if first is on public holiday) of each month.

Adelaide Lotus 1-2-3 User Group, Paul Wragg, Pannell Kerr Foster, GPO Box 1969, Adelaide 5001.

Adelaide Micro User Group, R G Stevenson, 36 Sturt Street, Adelaide 5000; for TRS80 and System 80 users.

Adelaide Osborne Group, Russell Barter, The Secretary, GPO Box 603, Adelaide 5001.

Adelaide Sega User's Group, Jamie Andersen, (08) 263 5020 (after 4 pm); meets on the first and third Wednesdays of the month, from 7 pm, at the Lutheran church hall, 137 Archer Street, North Adelaide.

Adelaide Super-80 User's Group, Mr L White, The Secretary, 503 Churchill Road, Kilburn 5084; meets on the third Monday of each month, (the second Monday in the case of a public holiday) at 7.30 pm in the canteen of Mason & Cox Foundry, 123 Hayward Avenue, Torrensview 5031, (08) 260 6226. Subscription: \$5 pa.

Beebnet, BBC and Econet User Group PO Box 262, Kingswood 5062; the group intends to produce a newsletter on a monthly basis. It is interested in any software producers or distributors who would be interested in serving the group's

market requirements.

Commodore/VIC Computer Users' Association, Mr Eddie Hann, 13 Miranda Road, Paralowie 5108; the SA branch meets monthly.

Compucolor-Intecolor Users of South Australia, PO Box 86, Torrensview 5031, (08) 352 3296.

DEC Personal Computer Special Interest Group, see NSW entry.

IBM-PC South Australia Users' Group, PO Box 68, Walkerville 5081.

Kaypro User Group, Ralf Engler, 16/34 John Street, Payneham 5070.

Microbee Users' Group of South Australia (MUGSA), The Secretary, GPO Box 767, Adelaide 5001.

Sega Users' Club, H.A. Jacobson, 10 Pioneer Avenue, O'Sullivan Beach 5166; (08) 382 7967.

South Australian Apple Users' Club, I.H. Bagust, c/o The Bookshelf, 169 Pirie Street, Adelaide 5000, (08) 293 7183; meets on the first Friday of each month in the Prospect Town Hall.

South Australian Commodore Computers' User Group, Eddie Hann, Secretary, PO Box 427, North Adelaide 5006; meetings second Tuesday each month, 7.30 pm, at Royal Caledonian Hall, 379 King William St, Adelaide 5000. (08) 258 6367.

South Australian Foundation for Computer Literacy, Michael Kennett, PO Box 210, Norwood 5067; caters for children from six years (unaccompanied) or four years with older friend or brother or sister. Special emphasis on the needs of handicapped, educably disabled and socially disadvantaged children, but *all* children welcome. Family participation encouraged. (08) 51 5474.

South Australian Peach User Group, Geoff Drury, 27 Creslin Tce, Camden Park 5038; special interest group attached to the SA Microprocessor Group, which holds separate meetings; (08) 295 2778 ah.

South Australian Microprocessor Group Inc (SAMG), The Secretary, PO Box 113, Plympton 5038, (08) 278 7288.

Sorcerer Users' Group of South Australia, Don Ide, 14 Scott Road, Newton 5074.

South Australian Apple Users' Club, The Secretary, c/- The Bookshelf, 169 Pirie Street, Adelaide 5000.

South Australian Microprocessor Group Inc. (SAMG), secretary Rick Mathews, 9 Anglesey Ave., St Georges 5064; (08) 79 3445; meets second Friday of every month, Institute of Engineers, Aust Bldg, 11 Bagget St, North Adelaide.

South East Computer Enthusiasts' Group, Glenn Mibus, 3 Millard St, Mount Gambier 5290; meetings second and fourth Tuesday of each month from 6.30 pm at Mt Gambier High School Computer Room, for all machines and interested parties. (087) 25 1046. ►

Victoria

Albury Wodonga User's Group, Jenny Scott (secretary), (060) 24 3225 or Don McLennan (president) (060) 46 028; meets second Wednesday of every month at Wodonga High School at 7.30 pm.

Apple Users' Society of Melbourne, D Halprin, PO Box 43, Forest Hill 3131, (03) 387 3221.

Atari User Group Melbourne, Kelvin Eldridge, PO Box 173, Reservoir 3073.

Australian Forth Interest Group, Tony Latermore, PO Box 704, Sale 3850, (051) 44 2011.

Australian North Star Users' Association, PO Box 194, Wangaratta 3677.

Ballarat Computer Users' Group, Publicity Officer: John Preston, (053) 31 4363.

Billanook Computer Forum, Maurie Canterbury, Cardigan Road, Mooroolbark 3138, (03) 725 5388.

BUG 80 (Burwood Users' Group), PO Box 46, Blackburn South 3130.

Chip 8, 6800, 1802 User Group, Frank Rees, 27 King Street, Boort 3537.

Compucolor Users' Group, L Ferguson, 12 Morphet Avenue, Ascot 3342.

DEC Personal Computer Special Interest Group, see NSW entry.

Forth Interest Group, Lance Collins, PO Box 103, Camberwell 3124; meets on the first Friday of the month at the Bowen Street Neighbourhood Centre, 102 Bowen Street, Camberwell South 3124. (03) 29 2600.

Geelong Commodore Computer Club, D Gerrard, 15 Jacaranda Place, Belmont 3216, (03) 44 2863.

Geelong Computer Club, Colin Lowne, PO Box 520, Geelong 3220; (052) 55 1232. Meets at 8 pm, on the first and third Friday of each month in the rooms of the Geelong Amateur Radio Club, Storrer Street, East Geelong.

IBM & Columbia Computer Users' Club, Giles Bray, 22/11 Auburn Grove, Hawthorn East 3123; meets second Tuesday each month, 7.30 pm, at the Victorian College of Pharmacy, (03) 82 7632.

Kaypro Users' Group of Victoria, George Kunz, PO Box 159, Forest Hill 3131; meetings fourth Sunday each month at Burwood State College Community Resources Centre at 2 pm. (03) 857 5462.

KAOS (Ohio Scientific), David Anear, 49 Millewa Crescent, Dallas 3047.

Latrobe Valley Colour Computer Users' Group, George Francis, 31 Donald Street, Morwell 3840; for TRS80 and MC10 users. (03) 22 1389.

Melbourne Atari Computer Enthusiasts, PO Box 340, Rosanna 3084; meetings held on second Sunday of each month (except January) at 12 noon at Monash University Rotunda.

Melbourne Lotus 1-2-3 Users' Group, Robert Taylor, (03) 267 4800.

Melbourne Microbee Users' Group (MBUG Australia Inc.), President Grant Forrest, PO Box 157, Nunawading 3131; meets at 7.30 pm on the second Wednesday of each month at Mount Waverley Crescent and Stephenson's Road, Mount Waverley. Different types of membership including country, bulletin board, city and student.

Melbourne PC User Group — IBM and compatibles, The Secretary, c/o Pannell Kerr Foster, 14th Floor, 500 Bourke Street, Melbourne 3000, (03) 830 5067 between 6 & 8 pm; meets the second Wednesday of each month at 6 pm in the ground floor auditorium, Clunies Ross House, 191 Royal Parade, Parkville.

Melbourne Hitachi Users' Group, Branko Colavizza, PO Box 191, Rosanna 3084, (03) 434 2541.

Melbourne Super 80 Users' Group, Hon. Sec. Victor Shuttleworth, (03) 723 2713.

MICOM (Microcomputer Club of Melbourne), PO Box 60, Canterbury 3126.

National Mutual Micro Users' Group, R Prewett, NMLA, PO Box 2830AA, GPO Melbourne 3001; for National Mutual staff.

National Sinclair User Group, PO Box 148, Glen Waverley 3150.

NEC Portable Users' Group, D Green; meetings second Wednesday of each month at Myers Computer Centre,

Lonsdale Street, at 7.30 pm. (03) 611 3380.

Northern/Western Suburbs Computer Users' Group, John King (Secretary), 284 Union Road, Moonee Ponds 3039. Contact CP/M Data Systems, (03) 338 9304.

Peninsula Computer Club, George Thompson, 3 Patterson Street, Bonbeach 3196; meets second Tuesday each month at Chisholm College, Frankston 3199; many types of computers catered for. (03) 772 2674.

Sega Users' Club, Peter Lindeman, 6 Bay Street, Port Melbourne 3207.

Seymour-Pucka Computer Club, Garry Sutton, 25 Malaya Road, Puckapunyal 3662; (057) 93 1091.

Sharp Computer Users' Association, The President, 7 Faye Street, East Burwood 3151.

Spectravideo Users' Group, Mitch Raitt, 3 Clivejay Street, Glen Waverley 3150, (03) 233 2357.

Sorcerer Computer Users' (Australia), Secretary, GPO Box 2402, Melbourne 3001.

TI-99/4A Users' Group Melbourne, Wayne Worlidge, 123 Ashburn Grove, Ashburton 3147, (03) 25 1832.

The Motorola User Group (MUGS), Clive Allan, 11 Haros Avenue, Nunawading 3131; group is interested in 6800/02/09-based computers, particularly if running Flex, although this is not a prerequisite to join. (03) 878 1298.

Upper Yarra Computer Reference Group, for microcomputer enthusiasts and educators. Contact Albin Wallace, Woori

Yallock Education Centre, (059) 64 6617.

Victorian Association of Computer Educators, Arthur Totrall, PO Box 69, Whittlesea 3757.

B5Victorian Osborne Users' Group, Bill Baker, PO Box 169, Camberwell 3124, (03) 850 4187.

Victorian VZ-200 User Group, Luigi Chiodo, 24 Don St, Reservoir 3073, (03) 460 3770.

Victorian Wizzard Users' Group, Barry Klein, 24 Russell Street, Bulleen 3105, (03) 850 7275.

Wizzard User Group, for owners of Dick Smith Wizzard and Funvision computers. The group operates only by mail and phone at present. Contact Barry Klein, 24 Russell Street, Bulleen 3105, (03) 850 7275.

Yarra Valley Commodore Users' Group — affiliated with the Melbourne Central Commodore Users' Group, Barrie Vickers (secretary), PO Box 176, Lilydale 3140, (03) 735 0638; meets on the first Tuesday of each month at the Melba Hall, Cnr Market & Castella Streets, Lilydale at 8 pm.

Yarrowonga Computer User Group, Chris Younger, 10 Witt Street, Yarrowonga 3730, (057) 44 385; for all machines.

ZX81 Software Exchange, c/- Chips Taens, 5 Muir Street, Mount Waverley 3149.

Western Australia

Agriculture Users' Group, c/- Mr R Fenwick, Dept. of Agriculture, Albany 6330. For farmers and the agriculture service industries.

CU West WA Compucolor/Intecolor Users' Group, John Newman, 8 Hillcrest Drive, Darlington 6070.

DEC Personal Computer Special Interest Group, see NSW entry.

KAOS-WA, Gerry Ligtermoet, 39 Cloister Ave, Manning 6152; for Ohio Scientific Users. (09) 450 5081.

Kaypro User Group of Western Australia, Ainslie Sharpe, PO Box 91, Claremont 6010; meetings second and fourth Mondays of each month in the Canteen of the Department of Agriculture, Jarrah Road, South Perth 6151. (09) 384 5511.

Microbee Users' Group of Western Australia, The Secretary, 4 Garnkirk Road, Greenwood 6024, (09) 447 5366.

OSWEST-Osborne Users' Group of Western Australia, Mal Ferguson, PO Box 149, Applecross 6153; meets first and third Wednesdays at the Palmyra Recreation Centre and the Subiaco Exhibition Hall respectively from 7.30 pm, for Osborne and other interested computer users. (09) 295 1449.

Perth 80 Users' Group, C Powell; for System 80 and TRS80 users. (09) 457 6849.

Perth Hitachi Peach Club, The Secretary, 1 Charf Court, Riverton 6155; for Hitachi

market directory

DEALERS, distributors, mail-order houses and other commercial organisations or individuals who have a message to spread but don't want to outlay the sums required for full-scale advertising can take advantage of our Market Directory — small ads to help those searching for outlets, services and equipment. For details contact Your Computer on (02) 663-9999 or write to PO Box 21, Waterloo 2017.
For 1/12 DISPLAY ADVERTS in the Market Directory (50mm deep x 60mm wide) costs are as follows: **1 insertion \$100. 3 insertions \$95 ea. 6 insertions \$90 ea. 12 insertions \$80 ea. 24 insertions \$70 ea.** Closing date = 6 weeks prior to publication date. Supply finished artwork — or copy to Set & Makeup (at \$25 extra to insertion cost). Payment strictly with copy. Call (02) 663-9999 for your booking NOW.

NEC PC-8201A LAP COMPUTER BUSINESS SOFTWARE

Have you ever put your hands on a General Ledger, Spreadsheet, etc...

BASIC program listing & flowchart?

Choose from: Spreadsheet & Graphing, General Ledger, Cashflow, Invoicing, Database & Sort, Printer Handler & File Encryption. Each program comes with a manual, a tape for the NEC PC-8201A, a BASIC listing duly commented & a flowchart so you can customise or PORT to ANOTHER MACHINE.

available exclusively from

ITEKA P.O. Box 684,
Blacktown. NSW. 2148.

To get the brochure send us your business card or name and address or see us on VIATEL page *38075#.

POOR PERSON SOFTWARE FOR CP/M 2.2 COMPUTERS

WRITE-HAND-MAN — Wordprocessing and can't find a pencil? One keystroke opens a window to save notes, edit a 'phone list, update a diary, scan a data file and do sums. Yes + - * / in decimal or HEX! Add YOUR option! 9-page manual, scads of source code, instructions... **\$45.**

POOR PERSON'S LABEL PRINTER — \$35, **CROSSWORD GAME** — \$26, **WINDOW SYSTEM** — \$33, **SPELLING CHECKER** — \$33, **SPOOLER** — \$42, **MENUS** — \$33, **KEYED SEQUENTIAL FILES** — \$36, **SPREAD SHEET** — \$35. Popular Formats, e.g. Kaypro II, Osborne DD, Xerox 820, Apple II CP/M, 8" SSSD, Microbee 3-1/2" and 5-1/4".

ALSO AVAILABLE

MEDIA MASTER for IBM-PC + compat. & Rainbow-100
Fuji Floppy Disks — Full Range — Lifetime Guarantee
Write for catalogue. Prices include tax.

Order by Credit Card:- Please charge my Bankcard ☐ MasterCard ☐
Card No. Exp. Date

Signature

GLYPHIC SOFTWARE
PO BOX 391 PENNANT HILLS 2120



commodore
computer centre

SERVICE **VIC 20 & 64** SALES

- Prompt repairs by friendly experts
- Easy Access
- Plenty of parking
- Open Saturday mornings
- Established 1968



Melbourne's largest range of Computers, Programs, Printers, Disc Drives, Monitors, Plotters, etc.

TELEPHONE: 419 6811

Maxwell OFFICE EQUIPMENT (VIC) PTY. LTD.
162 - 164 NICHOLSON ST.
(Near Collingwood Football Club) ABBOTSFORD

RENT IBM SOFTWARE

SYMPHONY \$109.50 (B)	SARGON III \$7.50 (G)
LOTUS 123 \$83.50 (B)	FLIGHT SIM \$9.90 (G)
MACRO ASMB \$17.50 (B)	PINBALL \$5.90 (G)
COPYWRITE \$9.95 (B)	ZORK I \$6.90 (G)

Join the **DOWN UNDER SOFTWARE** rental library, and save on all your IBM software. You pay only 10% of the **RECOMMENDED RETAIL PRICE**. Join the Games Library (G) for only \$25, join the Business Library (B) for \$30 or join both for only \$35. **START SAVING NOW** — your very first rental (including joining fee) will probably be less than buying the equivalent program!

Also genuine IBM-PC 2 Computers from \$2,616.

DOWN UNDER SOFTWARE
1 Botherambo St., Richmond
Ph: (03) 429-3216

CUT PRICE SOFTWARE!

Large range of business and entertainment software for IBM PC, Apple and Commodore 64.

Catalogue available now.

Interface Publications (Australia) Pty. Ltd.,

34 Camp Street, CHELSEA, Victoria, 3196

Send a large s.a.e. for the latest, complete catalogue.

HUGHES Phototype

TYPESETTING BY TELEPHONE

FROM COMPUTERS
OR WORD PROCESSORS

DISK CONVERSIONS

SPTT ROAD, SPTT JUNCTION, NSW 2088

960 2788

NEW

MICROMASTER SBC \$495*

A new complete single board computer specially designed for system integrators, OEMs, educators, and hobbyists.

- Z-80B CPU at 6 MHz
- 64K RAM
- Floppy disk controller for both 8" and 5" drives
- 2 Serial Ports
- Centronics printer port
- Clock/calendar
- Hard disk adapter (optional)
- DMA controller (optional)
- Improved CP/M compatible op system.

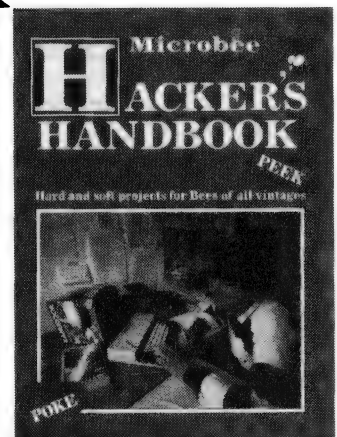
Available as board only or as complete system.
• Introductory special plus sales tax.

Microtrix Pty. Ltd.
24 Bridge Street, Eltham. 3095
(03) 439 5155.



**INTRODUCING
CRAIG ROWE
AD SALES
EXECUTIVE**

**THIS SIZE AD FOR A
LOW COST.
PLEASE CONTACT ME
ON 663-9999**



From the publishers of 'ETI' and 'Your Computer' magazines.

The Microbee Hackers Handbook will tell you how to:

- Get more from the Bee's graphics capabilities.
- Set up for telecommunications on the Bee.
- Play music on the Bee.
- Build a joystick and a light pen for the Bee.
- Get hardcopy — cheaply.
- Expand your 16K Bee to 32K
- Make the Bee a better games machine.
- Turn your Bee into a facsimile decoder.
- Solve equations on the Bee... and much more!

\$6.50 at your newsagent now.

CLUB FILE

Peach and 6809s. (09) 367 5880.

Sharp PC Users' Group, John Paulic, PO Box 79, Gosnells 6110, (09) 398 6303.

Sega Users' Group, John McClemon, 33 Favell Way, Balga 6061; (09) 342 5905.

Sorcerer Computer Users of Australia, The Secretary, 90 King George Street, South Perth 6151, (09) 367 6351.

The West Australian Atari Computer Club, Mr Alf Gaebler (Secretary), PO Box 7169, Cloisters Square, Perth 6000.

VIC-Ups, G. Padfield, (09) 451 4629.

Western Australian Wizzard Users' Group, John Reid, 13 Wenlock Road, Wattleup 6166, (09) 410 2359.

Western Australian ZX Users' Group, Phil Taylor, (09) 328 4111 bh.

Western Australian University Computer Club, 2nd Floor, University of WA, Guild Building, (09) 386 1455.

Tasmania

Apricot User's Group, Rick Snell, PO Box 286 C, GPO Hobart 7001, (002) 23 399926.
DEC Personal Computer Special Interest

Group, see NSW entry.

Devonport Computer Interest Group, John Steveson, RSD 422, Sheffield 7306, (004) 92 3237.

Down Under Atari User Group, contact Robert Bronstein, 191 Rokeby Street, Howrah 7018.

Spectravideo Computer Users' Group, Mr W P Decket, 48 Heather Street, Launceston 7250; membership costs \$15, which entitles members to a newsletter and to discounts on computer equipment. (003) 44 4836.

Tandy Hobart Users' Group, Ms KJ Rees, GPO Box 1271 N, Hobart 7001, (002) 72 1426; meets on the third Thursday of each month — contact Ms Rees for details of venue.

Tasbeeb, John Hannon, PO Box 25, North Hobart 7000; meetings first Monday each month at Elizabethan Matriculation College in D Block at 8 pm, for BBC computers. (002) 34 2704.

Tasmanian Apple Users Group, Ray Williams, PO Box 188, North Hobart 7008,

meets third Tuesday each month at 8.15 pm, 73 Murray Street, Hobart.

Tasmanian TI User Group, Co-ordinator, I Benboyd Court, Rokeby 7019; meetings third Sunday of each month at University of Tasmania, room 373. (002) 29 4009.

TAS-Micro, Peter Deckert, 1/456 West Tamar Road, Riverside 7250.

Northern Territory

Alice Springs Microbee Users' Group, Douglas Craigie, c/- PO Box 3230, Alice Springs 5750.

Darwin Microbee Users' Group (DBGU), Felino Molina, PO Box 3111, Darwin 5794, (089) 82 5613 bh, (089) 88 1455 ah.

Northern Territory Computer Club, Ian Diss; meets at Wulagi Primary School on the first and third Thursday of each month at 7.30 pm. Users of all machines and other interested parties welcome. (089) 27 9208.

Northern Territory 80 Computer User Group, R T O'Brien, 433 McMillans Road, Jingili 5792.

VZ-200 Users' Club, 7 Abbott Crescent, Malak 5793, (089) 27 2830.

North Star's Dimension.

THE IBM-COMPATIBLE MULTI-USER SYSTEM
THAT'S ENGINEERED FOR GROWING BUSINESSES



DISTRIBUTORS OF

NorthStar
The brightest alternative to PCs.™

The brightest alternative to PCs.

When you stop and think about it, personal computers really have no business being in a growing business.

Because PCs are expensive to add, difficult to network and can test both your patience and your wallet.

But now there's Dimension from North Star.

Dimension is a multi-user computer system that can support up to 12 work stations, each having more processing power than a stand alone PC.

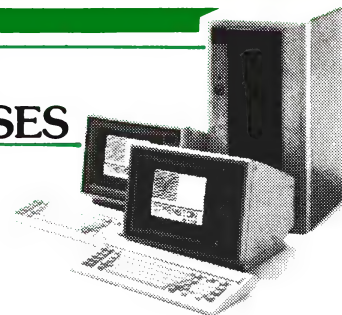
And new users can be added whenever you want for less than half the cost of adding PCs.

Regardless of how many users your Dimension has, they'll be able to share software, data and

expensive peripherals from the moment you plug the system in. Because Dimension has advanced networking capabilities built right in, unlike local area networks. This makes Dimension extremely fast.

While Dimension won't burden you with a PC's limitations, you'll still be able to use the most popular PC software. Because Dimension is compatible with all the best-selling programs for the IBM PC XT.

So before you decide on a PC you'll probably outgrow, take a closer look at Dimension. Call us now for your free data sheet.



MELBOURNE
TEL: (03) 792 4152



NEW DIMENSION COMPUTERS PTY. LTD.
PO Box 1167, Dandenong 3175. Victoria.
DEALER SUPPORT AVAILABLE

PERTH
JARASOFT
(09) 322 7499

The new Amstrad 6128.

A comparable 128K computer could easily cost you twice as much.

The popular Amstrad personal computers have quickly become top sellers in Europe and Australia, and have established an enviable "value for money" reputation. Now comes the remarkable Amstrad 6128 computer.

The Amstrad 6128 offers a powerful 128K memory, high definition green screen monitor, inbuilt disc drive and sophisticated CP/M PLUS* operating system from around \$800 all up. (Colour monitor package from around \$1000.) Other computers with similar capabilities can cost hundreds or even thousands of dollars more.

\$800 package offers real value for home or business.

- Powerful 128K computer
- High definition green screen monitor
- Inbuilt floppy disc drive
- CP/M PLUS* and AMSDOS operating systems
- GSX Graphics Enhancement
- Comprehensive User Manual
- Introductory program and exercises

Rapid loading, instant cataloguing.

The availability of such a low cost, disc based 128K system is a real breakthrough for both businesses and home computer enthusiasts. Programs are loaded rapidly and cataloguing is instantaneous. The CP/M PLUS* operating system is acknowledged as one

of the best and most practical in the world.

Other key features of the Amstrad 6128 system include a highly functional alpha-numerical keypad with programmable function keys and broad sound and graphics capabilities. Thus, the system offers considerable scope not only for educational and entertainment uses but also for many serious business requirements.

Wide range of programs available now.

Most of the programs developed for the Amstrad 464 and 664 computers can be used on the 6128. These cover a broad range of subjects including Business, Education, Games, Brain Power, Programming and Electronic Home.

In addition, there is an excellent range of custom CP/M PLUS* disc-based programs available.

In all, there are hundreds of titles to choose from covering all aspects of personal and business computing. Programs include Wordprocessing, Spreadsheets, Graphics, Accounting and many popular games. The Amstrad 6128 computer offers a wealth of applications for home and business.



Amstrad. Distributed and guaranteed by AWA-Thorn.

Amstrad computers are distributed and guaranteed by AWA-Thorn, one of Australia's most trusted names in home products. The new 6128 system is available at leading retailers and computer stores throughout Australia. Ask for a demonstration and you'll agree – no other system adds up to Amstrad.

For the location of your nearest Amstrad dealer, please telephone: Sydney, 638 8444; Newcastle, 52 7088; Melbourne, 459 1688; Brisbane, 44 7211; Townsville, 72 7755; Canberra, 80 5314; Adelaide, 269 1966; Perth, 277 7788; Hobart, 72 4366; Darwin, 84 3243

*CP/M PLUS is a registered trademark of Digital Research

AMSTRAD

Distributed and guaranteed throughout Australia by

AWA-THORN

TPR/623

GLOSSARY

A

Accumulator: The major register of a CPU, in which arithmetic and logical functions are performed. Some computers have several registers which can function as accumulators; in others, some registers can perform a subset of the full set of operations.

Acoustic Coupler: A device for connecting the telephone handset to data communications equipment.

Address: A memory location which can contain data or an instruction.

AI: Artificial Intelligence.

Algol: Algorithmic Language. An early computer programming language for mathematical applications. Widely used in Europe, it embodied early structured programming concepts and was a precursor of Pascal.

Algorithm: A set of instructions which define a method of obtaining some result (usually mathematical). A cooking recipe is an algorithm, as is a knitting pattern.

Alphanumeric: Composed of letters or numbers or both.

Analogue (Analog): Representation of a value by a voltage or some other measurable datum, rather than a binary or other representation based on counting.

Application: What you do with your computer. For example games, word processing and graphics.

Array: A set of values under a common variable name, accessed through a subscript. For example A[1] is the first item in array A, A[2] is the second, and so on. A[N] is the Nth item.

ASCII: American Standard Code for Information Interchange; a common system for representing character information.

ASM: Assembler. Also a suffix added to assembly language file names under CP/M to distinguish them from other files with the same name.

Assembler: A program which converts assembly language into its corresponding machine (or object) code, which can be executed by the computer.

Assembly Language: A language in which each machine code instruction is represented by a short mnemonic which is much

more comprehensible to the programmer. For example, the 8080 machine code instruction: 10010110 is: SUBL(subtract contents of register L from accumulator) in assembly language. Each line of assembly language becomes one machine instruction.

Assign: To make one thing equal to another; for example, [AB] assigns the value of B to A.

Attribute: A property possessed by some object, such as a file being read-only.

B

Background Task: In a multi-programming environment, a low-priority program which runs when the processor has nothing else to do.

Backup: An extra copy of a disk, tape or file taken as a precaution against damage to the original.

Bandwidth: The range of frequencies that can be carried by a communications channel.

Base: The lowest number inexpressible as a single digit in a given number system.

BASIC: Beginners' All-purpose Symbolic Instruction Code. Invented in 1970 at Dartmouth College by Kemeny and Kurtz as a teaching language, it has since been enhanced in its more exotic forms into one of the most sophisticated yet easy-to-use languages available on personal computers. Its major rival is Pascal, which has the added virtue of stressing structured program design.

Baud: The number of bits transmitted per second along a data communications line.

BCD: Binary Coded Decimal, a 4-bit binary representation of the digits 0 through 9, with two BCD digits usually packed in a byte.

BDOS: Basic Disk Operating System. The major functional component of the CP/M DOS.

Binary: The base 2 system of counting used by digital computers.

Binary Search: A method of finding an entry in a table by successively halving the table until all that's left is the desired entry.

Binary Tree: A form of data structure in which entries are tagged on at the end of the appropriate branches.

BIOS: Basic Input/Output Sys-

tem. The part of the CP/M operating system which is different for each type of machine and provides any special I/O routines for disks, terminal, printer, and so on.

Bit: Binary digit, being the basic unit of data storage. Either 1 or 0, off or on, true or false.

Block: A physical division of data in a logical record.

Boot: To load the operating system into the computer from a disk or tape, either initially or subsequently after running a program.

Bootstrap: To use one short program to load a longer loader program which then loads the operating system.

Branch Instruction: A program instruction which causes the computer to jump to another instruction.

Buffer: An area of memory used for temporary storage while transferring data to or from a peripheral such as a printer or a disk drive.

Bug: An error in a program. Makes programmers itch.

Bus: A set of wires over which data, addresses, or control signals are transferred between the central processor and memory or I/O devices.

Byte: A computer word eight bits wide. A byte in memory can hold a character or a binary number between zero and 255 (or -128 and 127), or a computer instruction.

C

C: A programming language, developed at Bell Labs, which is particularly convenient for writing system utility programs.

Call: A jump to a subroutine which leaves the return address on the microprocessor stack, so when the subroutine is finished executing control returns to where it left off.

CBASIC: A commercial version of the BASIC language, running under the CP/M operating system. Doesn't use line numbers on every line, and is compiled, rather than interpreted like Microsoft BASIC.

CCITT: Consultative Committee on International Telegraphy and Telephony. The committee sets standards for various aspects of telephone and telegraph usage.

CCP: Console Command Proces-

sor. The part of the CP/M operating system that reads a command line and sorts out what it means.

Chain: To automatically run one program after another.

Character: A letter or number, or in some circumstances a control code such as 'carriage return'.

Checksum: A running total of the characters in a file, recorded or transmitted with the file so that errors can be detected.

COBOL: Common Business Oriented Language; a high-level language, mainly used in business applications.

Code:

Absolute: Machine instructions which are intended to be loaded and executed in a particular area of memory.

Object: Machine instructions, as distinct from the source code from which it was generated.

Re-entrant: Code which may be called by more than one program at a time.

Relocatable: Code which can be loaded and run anywhere in the computer's memory.

Source code: A program written in assembly language, or a high-level language such as BASIC, which must then be assembled or compiled to produce the object code which can actually be executed.

Cold Boot: To start up a system from scratch, loading the operating system from disk or tape.

Cold Start: See Cold Boot.

COM File: In CP/M parlance, a command file; that is, a machine code program that can actually be run.

Command: An instruction from the console for the system to do something.

Comment: A note added into a program to help the reader (or programmer) to understand its operation. Does not affect the program's execution in any way.

Compiler: A program which accepts as input a source file written in a high-level language, and produces as output an object file containing the machine instructions which are actually executed.

Concatenate: To join two strings together, one after the other.

Conditional: A test; for example, is X greater than Y:

IF X > Y THEN GOSUB 500 (BASIC)

GLOSSARY

Conditionals are one of the most powerful features of any computer language.

Configure: To organise the I/O or other aspects of a system.

Console: The keyboard and screen from which the operator controls the computer.

Control Characters: Codes which perform functions like acknowledging correct receipt of a message or requesting retransmission of an erroneous message. Control characters are defined as part of the ASCII and similar codes.

CP/M: A disk operating system for 8080- and Z80-based microcomputers. Allows the user to store information and programs in named files, as well as managing disk storage and input/output functions. Other disk operating systems include TRSDOS (on TRS-80), DOS 3.3 (for Apple) and MSDOS on many 16-bit micros.

CPS: Characters Per Second.

CPU: Central Processing Unit. The part of the computer responsible for fetching, decoding and performing instructions.

Crash: A situation where the system becomes inoperative, due to a hardware or software error.

CRT: Cathode Ray Tube. Usually refers to the screen of a video terminal.

D

Daisywheel Printer: A high-quality printer which has a print-head in the shape of a daisy.

Data: Information to be processed by, or output from, a program.

DBMS: Data Base Management System. A program which manages the systematic storage and retrieval of a centralised data pool.

DDT: Dynamic Debugging Tool. A program that assists the user to find errors in machine code programs.

Debug: To locate and fix errors.

Decimal: Based on ten.

Device: A piece of equipment such as a printer or tape drive which the computer uses.

Directory: A list of the programs on a disk (or occasionally tape) together with necessary information, such as length and location.

Disk: A flat, circular magnetic surface on which the computer can store and retrieve data and

programs. Is fast compared with tape, particularly when information is not stored sequentially.

Disk Drive: The mechanical assembly which rotates the disk and positions the read/write head.

DOS: Disk Operating System.

Disk Operating System: A program which operates one or more disk drives automatically and manages the system.

Display: The computer's output device at the console, usually a TV-like display of letters and numbers; sometimes the computer can produce graphics (charts and pictures) on the display.

Distributed System: A system in which information is stored in several computers; peripherals may be shared, but the information storage is decentralised.

Dot Matrix Printer: A printer which creates a text image from a cluster of dots; produces relatively low-quality, high-speed text and graphic output.

Double Density: A method of recording twice as much information on a floppy disk, requiring a higher-quality recording surface than on a single-density disk.

Driver: A program which controls input and output to a device.

E

EBCDIC: Extended Binary Coded Decimal Interchange Code; an 8-bit character coding system — IBM's answer to ASCII.

ED: An editor program; part of CP/M.

Editor: A program which lets you alter and correct source files and other documents.

Error Message: Tells you something went wrong, and sometimes what.

Execute: To run a program; to follow its instructions.

F

FIFO: First in, first out. A technique used in memory management procedures, or a device used in buffering data flow between two asynchronous devices operating at different speeds.

File: A continuous collection of characters (or bytes) saved on a disk or tape for later reloading.

Fixed Point: Counting in integers

only. Usually limited to small values, and restricted in accuracy, giving rise to ridiculous answers such as 9/5 1.

Flag: A variable, sometimes a single bit, which can have only two values and is used to indicate some condition.

Floating Point: The kind of arithmetic used in scientific calculators.

Floppy Disk: A disk, made of thin, flexible mylar, and enclosed in a card jacket, which can be used for magnetic storage. There are three varieties, 9 cm, 13 cm and 20 cm. These can typically store somewhere between 140,000 and three million bytes (characters).

Flowchart: Symbolic representation of the sequence of instructions in a program.

Focal: Formula Calculator. A simple language rather like a small BASIC, found on some mini and microcomputers.

FORTAN: Formula Translator. One of the first computer languages, and beginning to show it, although still the king of the scientific or number crunching languages.

Function: A sub-program that processes variables in some well-defined way.

G

Garbage Collection: The process of going through memory or disk space, reclaiming all the redundant used space.

Gigabyte: One thousand megabytes (1,024,000,000 bytes).

Glitch: A pulse of electronic 'noise' which may cause a system failure.

Global: A variable which is known to all the parts of a program. See local.

H

Handshaking: A technique for controlling data communication between two devices; data flow only occurs when the receiving device sends a signal indicating it is ready to receive.

Hard Disk: A disk made of hard material, which is larger, faster and more fragile than a floppy disk, but capable of storing 70 million bytes or more.

Hard Copy: Printout.

Hardware: The bits of a com-

puter you can kick, as opposed to the programs you can only swear at.

Hashing: A method of reducing the size of a table which otherwise would have mostly empty entries.

Hexadecimal: The method of counting to the base sixteen or the method of splitting binary digits into groups of four, which is the same thing. In hex, you count: 0 1 2 3 4 5 6 7 8 9 A B C D E F 10 11 12 13 14 15 16 17 18 19 1A 1B 1C 1D 1E 1F 20 21 22.

I

IC: Integrated Circuit.

Identifier: A label, or the name of a variable.

Index: A variable which usually points to an entry in a table or list.

Index Register: A processor register which is used to access tables and lists in memory.

Indirect Addressing: Referring to a variable which actually contains the address of another variable.

Inkjet Printer: A device which prints by electrostatically aiming a jet of ink onto the paper.

Input: To get data into the computer.

Instruction: A step the computer can perform.

Instruction Set: The range of commands which can be performed by a particular processor.

Integer: A whole number.

Integrated Circuit: A circuit built on a single chip of silicon.

Interface: The (hardware or software) connection between any two devices.

Intermediate Code: A special kind of object code which cannot be run directly on the computer, but must be interpreted.

Interpreter: A program which examines source code a line at a time, decides what it means, and then does it. Compare with compiler.

Interrupt: To electronically drag the computer away from what it is doing in order to respond to some time-critical situation.

I/O: Input/Output.

I/O-bound: A process in which the performance speed is limited by the speed of input/output.

GLOSSARY

J
Jump Instruction: Normally, control proceeds from one instruction to the next, one after the other. A jump instruction passes control, not to the following instruction, but to some other. Jumps can be conditional.

K
Kilo-: Prefix meaning one thousand.
Kilobyte: 1024 bytes (Kbyte).
Kilobaud: 1000 baud (Kbaud).

L
Label: A word which identifies the destination of a call or jump instruction, or simply identifies some location in memory.
LAN: Local Area Network.
Language: The set of instructions, and rules for stringing them together, which you use to instruct the computer what to do.
Laser Printer: A printer which works a bit like a photocopier, but uses a laser to draw an image directly onto the printing drum.
LCD: Liquid Crystal Display.
Library: A set of programs, or sub-programs, that can be called from your program so you don't have to waste space with a block of commonly used code; for example, a date routine can be held in a library.
LIFO: Last In, First Out. A device or data structure in which the most recent item stored is the first available for retrieval. A stack is a LIFO.
Line Number: A number at the beginning of a line, which identifies it in a similar way to a label.
Line Printer: A high-speed printer for computer output.
Link: Part of a data item in a list, which tells the computer the location of the next data item.
LISP: List Processor. A language much favoured by the artificial intelligence community.
List: A sequence of consecutive data items.
Load: To transfer some data or program into the computer memory.
Locate: To 'fix' a relocatable code so it will only run if loaded in a particular location.
Local Area Network: A system of

interconnected computers, within a limited geographical space (usually in a single building).

Logical Device: A device as the computer 'sees' it: what the computer regards as the 'list device' may be one of several 'physical devices', such as a line printer or teletype.

Loop: To repeatedly execute a sequence of instructions; part of a computer program that is so executed.

M
Machine Language: The binary codes the machine actually executes.

Macro: A user-defined sequence of instructions which can be inserted anywhere in a program. See Library.

Macro-assembler: An assembler which can utilise macros.

MBASIC: Microsoft BASIC, the BASIC used in the TRS-80, PET, Apple II and so on.

Megabyte: One thousand kilobytes — 1,024,000 bytes (Mbyte).

Memory: Where the computer stores data and programs internally for fast access.

Menu: A display which offers the operator a choice of alternatives.

Microcomputer: A small computer based on a microprocessor.

Micro-floppy: A 9 cm 'floppy' disk, produced with a rigid plastic case.

Microprocessor: The central processing unit of a computer, built into a single silicon chip.

Millisecond: One thousandth of a second.

Mini-diskette: A 13 cm floppy disk.

MIPS: Million Instructions Per Second. A measure of processor speed.

Modem: Modulator/Demodulator. Device used to link a computer to the telephone line. It encodes digital bits into frequencies, and vice-versa.

MOS: Metal Oxide Semiconductor. Technology used for manufacturing high-density semiconductors. CMOS (complementary MOS) technology is characterised by low energy consumption, and is increasingly used in portable computers.

Mouse: A device connected to a computer which, when moved around on a desk, moves a pointer on the computer screen.

MP/M: A multi-user version of

CP/M.

Multiplexer: Device used to divide a communications line among a number of users.

N
Nanosecond: One billionth (.000000001) of a second.

Nibble: Half a byte (4 bits).

Node: A connection point on a network.

Network: A system of interconnected computers.

O
Object Code: Machine code.
Object File: A file containing object code.

Object Module: An object file containing part of a program, ready to be linked to others.

Octal: The system of counting to base eight, or grouping bits in threes.

Offset: To give the operating system the characteristics of a file so that it can subsequently read or write it.

Operand: The number an operator (+, -, and so on) operates on.

Operator: An arithmetic function or some other function which alters variables.

Optic Fibres: Cables made from thin fibres of glass (or similar material). Signals are encoded as light and transmitted along the cables.

Optimisation: Making a program work better (or faster, or using less memory).

Output: What the system produces.

Overlay: A technique for efficient use of memory space, in which different routines use the same memory locations. Routines using the same area are held in a backup store, and transferred into memory when needed.

P
Packed Data: Data which shares the same address, and has to be unpacked before use.

Packet Switching: A system of communicating data by dividing it into small packets addressed to particular receivers.

Page: A length of memory, typically 256 bytes.

Parallel Transmission: A method of moving data so that all elements of a compound unit are sent simultaneously. For exam-

ple, the eight bits in a byte may be sent at the same time by using eight channels. This is the method used within the computer, and with some printers. Fast and expensive.

Parameter: A constant which sometimes has to be varied.

Parity: An extra bit on the end of a character or byte for error detection.

Pascal: A modern structured language which may eventually rival BASIC in popularity for micro-computers.

Password: A secret word the system may demand of you before allowing you access to certain (or all) programs or data.

Patch: A temporary (ha, ha) fix on a bug.

Peripheral: A piece of equipment the computer uses, like a printer, disk drive, or modem.

Physical Device: See Logical Device.

Picosecond: One trillionth (.000000000001) of a second.

PIP: Peripheral Interchange Program. A CP/M utility for copying files between devices.

PL/I: Programming Language One. A good general purpose commercial language.

Pointer: A variable used for indirect addressing.

Polish Notation: A method of separating operators and operands; for example, + 5 4 is Polish notation for 4 + 5.

Poll: To ask a peripheral if it requires service. For example, a processor will regularly check a terminal to see if it has output ready to be processed.

Port: A physical input/output connection point.

Postfix Notation: Also known as Reverse Polish Notation, this is similar to Polish; + 4 5 means 4 + 5.

Preprocessor: A program which does part of a job to make life easier for the program which follows; for example, a macro processor before an assembler.

Priority: The resolution of which interrupt is serviced first if two should arrive at the same time.

Process: A program.

Processor-bound: A process in which the limiting performance factor is the speed at which the processor can perform the required computations.

Program: A sequence of instructions which can be understood.

GLOSSARY

and ultimately followed by a computer.

Prompt: A message asking the operator or user to supply information.

Protocol: The rules governing the exchange of information between two devices.

Q

Queue: A list in which entries are made at one end, and removed from the other.

R

R/O: Read Only; cannot be overwritten.

RAM: Random Access Memory.

Random Access Memory: The computer's internal memory, which is used to hold running programs and data. The computer can write and read RAM.

ROM: Read Only Memory.

Read Only Memory: Internal computer memory used to store programs, which cannot be erased or overwritten.

Reader: Paper tape input device.

Read/Write Head: The small coil which reads and writes on the surface of a disk.

Real-time: A system in which the processing of data input to the computer takes place virtually simultaneously with the actions which generate the data.

Record: A set of related data items. For example, an employee's name, address, payroll number and pay rate.

Recursion: The ability of functions in some languages to call themselves.

Re-entrant Code: Code which can be used by several programs simultaneously, keeping separate data for each.

Register: A location in the processor capable of performing logical or arithmetic functions on the contents.

Relocatable: Capable of being moved in memory.

Relocatable Object Module: Part of a larger program consisting of many such modules, all linked together and located.

Resident: Permanently in the system.

Reverse Polish Notation: See Postfix.

RS232: (also RS232C) Registered standard 232C. A widely used standard for connecting com-

ponents in a computer system.

Run: To execute a program.

S

S100: A popular 100-line micro-computer bus, originally developed for the first 8080-based computer.

Save: To store a program on disk or cassette (particularly BASIC).

Screen: See CRT.

Sector: A section of data on a disk.

Serial Transmission: Movement of data one bit at a time. One byte will be sent as eight bits, one following the other. Cheap and slow.

Simulation: Making one system behave like another.

Software: Programs.

Source Code: The original text form of a program.

Source File: A file of source code.

Source Language: The language the source code is written in, for example, BASIC, Assembler, C.

Sort: To arrange items of data in order.

Spool: Simultaneous Peripheral Operations Online. A method of outputting information by queuing information for low-speed output devices, while simultaneously continuing other computer operations.

Stack: A list in which both entries and removals are made at the same end. A microprocessor usually has a hardware stack which is used to save subroutine return addresses, for temporary storage of data, and to pass variables between subroutines.

String: A sequence of characters.

Submit: To put the system under control of a file of system commands.

Subroutine: Part of a program which can be accessed from several points within the program.

Symbol: The name of a variable or a location in memory.

Symbol Table: A table constructed by an assembler or compiler to give the addresses of all variables and labels in a program.

System: A collection of hardware and software, possessed of the property that the whole is greater than the sum of the parts.

System Disk: A disk carrying the operating system.

T

Teletype: An electro-mechanical printer/keyboard.

Terabyte: One thousand giga bytes (1,024,000,000,000 bytes).

Timeshare: Running several programs on a system simultaneously.

Track: The area under the read/write head during one rotation of a disk.

Transient: A program that is only in memory for a short time before being overwritten. Often, the only program that is not a transient is the operating system.

Tree: A list in which each data item may refer to several others.

TTY: See Teletype.

U

UART: Universal Asynchronous Receiver/Transmitter. A device which handles the serial-to-parallel and parallel-to-serial conversion of bits in a data message.

Unix: A multi-user, multi-tasking, multi-programming operating system.

Utility: A program of use to most users.

V

Variable: Named quantity that can take on different values.

VDI: Video Display Terminal.

VDU: Video Display Unit.

Verify: To check that data written on a disk or tape can be read again correctly.

Vitel: Telecom Australia's videotext system.

Videotext: Also known as view-data. A technology which uses slightly modified domestic televisions to access data from a computer database along the telephone lines. Prestel in the UK was the first such system. Australia's version is called Vitel.

Virtual Memory: A technique allowing programs larger than RAM to run. Only part is in memory. Parts are swapped from an online storage device as required.

W

Warm Boot: To reload the operating system a second or subsequent time.

Window: A part of a computer screen which has been divided into sections for displaying distinct information. On some systems which run a number of processes at once, each concurrent process may be displayed in its own window.

Word: The amount of data fetched from one memory location. Typically one byte, but can be two on recent processors.

Word Processor: A system for manipulating, editing, printing and formatting text files.

WordStar: A proprietary word processing program.

Word Wrap: A word processing function which automatically breaks lines exceeding the set right margin limit, and begins placing the words on the next line.

Write Protect: To remove the cover from the notch in a 20 cm floppy disk, so it cannot be written on. With 13 cm mini-floppies, the reverse action (that is, covering the notch) will write-protect the disk.

Z

Z80: A popular 8-bit micro-processor.



LETTERS TO THE EDITOR

We are happy to receive your comments and, if they are of interest to other readers, publish them. Letters will only be considered for publication if they include your name and address, although we can withhold such details from publishing on request. Note that we reserve the right to (and probably will) edit all letters for the sake of brevity, clarity or accuracy.

SUBSCRIPTIONS

Standard 12-issue rate within Australia: \$27. Surface rate for New Zealand and Papua New Guinea: \$35.60; airmail rate: \$47.60. Rates for other countries on application. All overseas rates quoted are to be paid in Australian dollars. Allow up to eight weeks for subscription processing.

BACK COPIES

Back copies and single issues are available from the publisher's office (\$2.95) or by mail (\$3.95). We will supply photostat copies of articles where a back issue is not available, at the single-magazine price for each feature copied.

READERS' ENQUIRIES

We will make every effort to answer readers' written enquiries, if accompanied by a stamped, self-addressed envelope, although staff shortages and deadline pressures may cause delays. Please include your telephone number(s) with any enquiry. Phone enquiries not related to subscriptions, readers' advertisements, or other 'service information' cannot be accepted.

COPYRIGHT

All material appearing in *Your Computer* magazine is copyright and cannot be reproduced in part or in full, by any means, without the written permission of the Publisher or Managing Editor. Computer clubs and schools can, however, apply for restricted permanent reproduction rights for non-commercial, limited-circulation use (for example, newsletters and class instruction). Given that it sometimes takes us a while to answer such requests, you can consider that restricted permanent rights apply in these cases from the day you send in your letter, and will later be confirmed (or withdrawn) by our reply.

LIABILITY

Although it is policy to check all material used in *Your Computer* for accuracy, usefulness and suitability, no warranty, either expressed or implied, is offered for any losses due to the use of any material in this magazine.

EDITORIAL CONTRIBUTIONS

Contributions to *Your Computer* are welcomed and will be given every consideration*. Please read these notes carefully to get an idea of the style and format we prefer.

All Contributions: should include your name, address, and home and office phone

numbers (in case we need to check details). Each page of your submission, and any material sent with it, should also carry your name.

Contributions by Telephone: Contributors who have modems and suitable software (in the MODEM7/YAM mould – see our stories on Christensen Protocols in the May and June 1983 issues) can arrange direct transfer to our computers through our Bulletin Board system, which is on-line 24 hours a day, seven days a week. Contact our office by phone for details on transferring material in this way.

Contributions on Disk: Contributions can be accepted in a wide variety of disk formats, although some have to be converted outside our offices, which will add to the (often lengthy) delay between receipt and acknowledgement. The preferred medium is IBM standard format single-sided, single-density, 20 cm CP/M disks. We can also handle, in-office, Kaypro II and Osborne 13 cm disks, and 13 cm Apple DOS or Apple CP/M disks. Please pack them extremely carefully if posting and label all disks with your name, address and phone number.

Listings: Unless it is absolutely impossible, we want listings produced on the computer. This reduces the risk of error – if the computer typed it, the computer probably accepted it. Print listings with a dark – preferably new – ribbon on white paper, and try to format the output to a narrow (40-characters) width. If they can't be produced on a printer, borrow a good typewriter – hand-written material is likely to sit around the office for a year before someone can find time to type it all out for you! Please provide an account of what the program does, how it works and so on. Any comments on the program should refer to the address, line number or label rather than to a page number. Any comments on modifying the program to work on other machines will be appreciated. Try to include a printout of at least part of a sample run if possible.

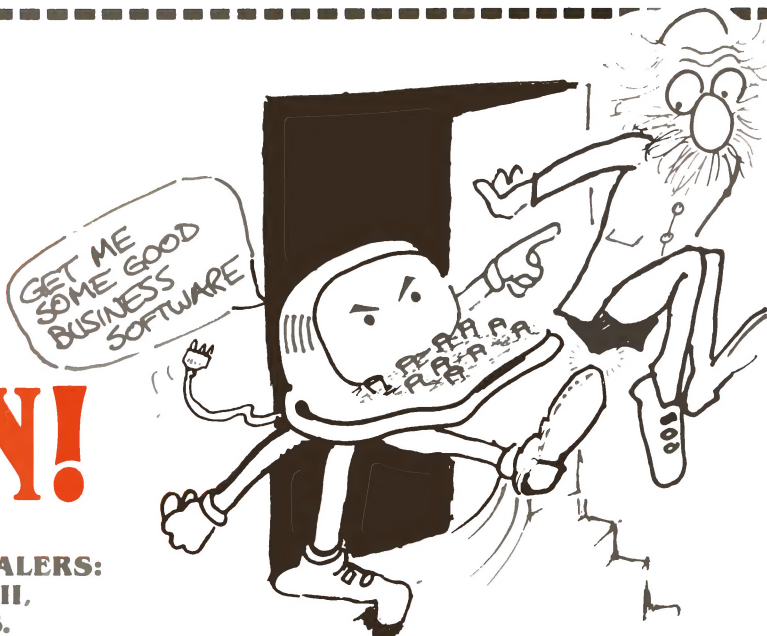
Style: All items should be typed (or printed) and double-spaced on plain white paper. We will only accept original copies – no photostats. Include your name, address, telephone number and the date on the first page of your manuscript (all manuscript pages should have your surname and page number in the top right-hand corner). Be clear and concise, and keep jargon and adjectives to a minimum.

*Although the greatest care will be exercised with contributions, no responsibility can be accepted for the safety or return of any letters, manuscripts, photographs or other materials supplied to *Your Computer* magazine. If return is desired, you should include a stamped, self-addressed envelope. If return is critical – say it's something you can't afford to lose – then don't send it; we *are* careful, but we're not perfect. □

ANI Tech	143
Applied Technology	10
Arcom Pacific	32
ATS	55
Aust Microcomputer Solutions	129
Automatic Ice	116
Automation Statham	81, 146
AWA	74
AWA Thorn	155
Award Software	148
Breeze Software	49
Brother	77, 79
Canon	123
Charlie's Computer Products ...	109
Commodore	139
Compumax	110
Compushack	9
Computer Spot	12
Computer Trader	116, 128, 132
Consultech	104
Datascape	137
Dick Smith	147
Emona	120
Energy Control	54
Exitek	71
Fagan	26, 29, 48
John Sands	91
Labtam	23
Logo Centre	85
Market Directory	153
Memorex	OFC
Nashua	18, 103
Natwick Management	88
Netcomm	17
New Dimension Corp	154
Nucleas	61
Osborne	25, 36, 140
Pacific Electronics	134
Perfect Information	67
Perito Holdings	127
Professional Business Machines	125
Quasar Computer Systems	116
Qubie	90
Queensland Art Union	50
Research Technology	101
RF Communications	13
Ritronics	31
Robert Woodland Exhibitions ...	47
Seiko	42
Six-S	161
Software Centre	135
Software Source	7
Speedit	92
Stemsoft	47
System Solutions	124
Technology Corporation	82
Telecom	34
Telecorp	73
TNT Group 4	5
Total Solutions	117
Verbatim	122
Video Technology	56
Word Express	130

IT'S ON AGAIN!

FROM PARTICIPATING DEALERS:
SUITS APPLE II, IIc, IIe, III,
IBM PC AND LOOKALIKES.
(ASK FOR HARDWARE CONFIG. DETAILS)



SIX'S' SOFTWARE 6-PACK

\$1195

NORMAL RETAIL VALUE OF THIS SOFTWARE
PACKAGE \$2130

Plus
Special
Offer

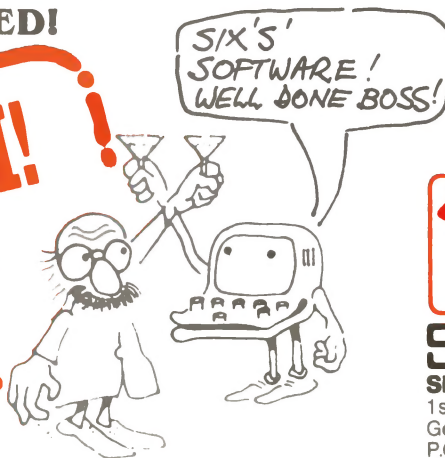
THE 6S SOFTWARE 6-PACK INCLUDES

- **DEBTORS** with sales analysis and comprehensive reports
- **INVOICING** with automatic pricing and full integration to Debtors/Inventory ledgers.
- **INVENTORY** with sales and profitability analysis - auto buying levels
- **CREDITORS** open item, with complete automatic G/L integration
- **GENERAL LEDGER** with automatic balancing and double-entry
- **PAYROLL** with pay slips, group certificates, automatic taxing and holiday pays.

**GIVE YOUR COMPUTER WHAT IT WANTS
- AND WHAT YOU NEED!**

NEWSFLASH!

Six "S"
Business Software
is now on the
Macintosh



To further enhance the value of the 6-pack: You can receive **ABSOLUTELY FREE** the incredible

- **ASK: Accounting Scenario Key Program** for business analysis
- **TELL: A powerful, effective word processor.**

ONLY APPLICABLE TO SUITABLE HARDWARE



SOFTWARE

Six "S" Business Advisory Pty. Ltd.
1st floor, 39 Gheringhap Street,
Geelong, Victoria 3220
P.O. Box 1220
Telephone (052) 22 4311

PROVEN, GUARANTEED, SUPPORTED

Y/C

Cam. Wil 1112

your computer

WARM BOOTIES

Everybody's doing it ... themselves. It's much cheaper than going for the ready-made types, and it means you're responsible for your own mistakes. You'll get real satisfaction out of creating your own, and you'll be able to show your handywork to dinner guests, neighbours, the bridge club, the postman — they'll all be amazed, and envious.

You'll get hours of enjoyment from crocheting individual booties for your computer's keys, or from constructing a papier mache bubble surround for your terminal, or from knocking together an oak-veneered stand to support your printer and a couple of pot plants, maybe. Have you ever contemplated a floppy-disk mobile? ... let your imagination run wild.

Then, in *Your Computer* November, we'll supply you with the patterns, blueprints, cut-out templates, specifications, instructions, how-tos, know-hows, step-by-steps, and wherewithals for *adding a hard disk* to your IBM PC, making your own RS232 *cables* and writing your own *C programs* ... gloves, scalpel, screwdriver, pliers — we're going in.

For those who prefer living in the material world, who believe the buying and the spending of money is nine-tenths of the fun, who

aren't into homespun, we'll be taking the microscope and fine-toothed comb to *Supermicros*.

On the review side: if you're a weakling, we've got TI's Prolite; for the heavyweights, we've got the NCR PC4i; people who cry in mushy movies will enjoy the Microbee User Report; those who are accountable could find good value in the FBS integrated business accounting and stock control software; if you're just not coping with all that data, we've got the Sensible Solution (another Great Database); and then there are the bits in the bucket.

We'd like very much to also fit some more data communications into November; there's much more to be seen, and Noncomm Nat's really got the bug.

Our regulars can look forward to the regulars: Philsie is taking a new tack with Structured Programming, and we're trying to get as much Marketing out of Les as possible before he goes overseas. Norman (secretly known as the Viatel Viper) will be Grapevining as usual, and has an interesting do-it-yourself-type applications story, which will warm the cockles of Commodore users' hearts and might make would-be buyers of business computers think twice about spending their money on an expensive machine.

JINGLE BELL

Just think, there are less than 90 shopping days until Christmas! Come on, don't start frantically tying knots in your purse strings — relax. The jolly-nosed, white-bearded, dashing through the shops with an off-course open trolley hype is going to get to you no matter what — resign yourself to it. We have. In December's *Your Computer* we'll be telling you what kind of machines, peripherals and software you should be buying your grandmother, your boss, your business, your toddlers, your spouse, your neighbours, your best mate, your worst enemy, and so on ...

If you're into togetherness, December's multi-user machine co-feature might help you decide which computer would let you all work together as one — that's the spirit.

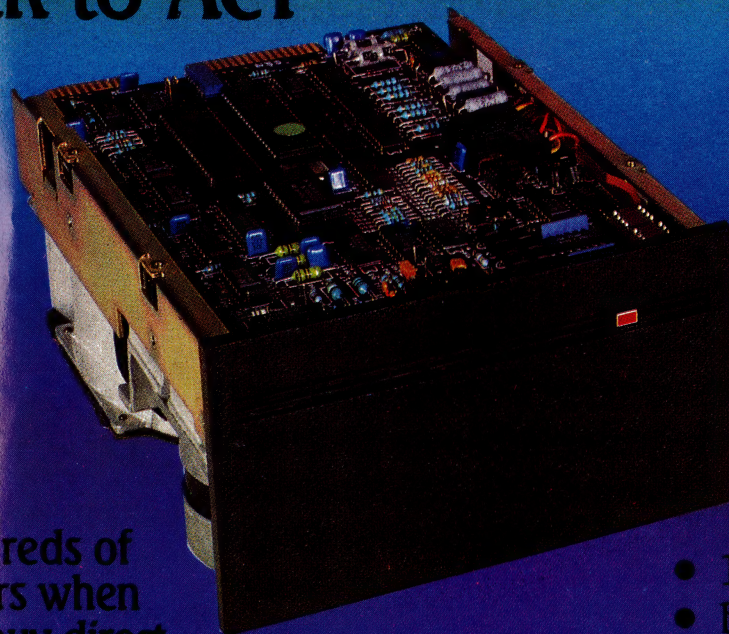
So, distributors and manufacturers should be putting us on their Christmas card list, informing us of interesting goodies for the

shopping guide and of computers capable of babysitting several humans at once. All such mail must be on the eggbeater's desk by November 1.

Oh, by the way, when you're out searching for stocking-filler-type gifts to give your favourite computer freak, you should have a flip through the *Your Computer Yearbook* (out about then). We're sure it'll be one of those readables you buy someone else 'cause you want to delve into it yourself. Perfect for when the you've let the roast turkey get you down, and that big lump of Christmas pudding you ate for desert has got you pinned firmly to the livingroom floor - we can't think of anything you'd rather do than read some of the past year's best and a whole lot of completely new articles, including a preview of the 1986 Computer of the Year Award contenders.

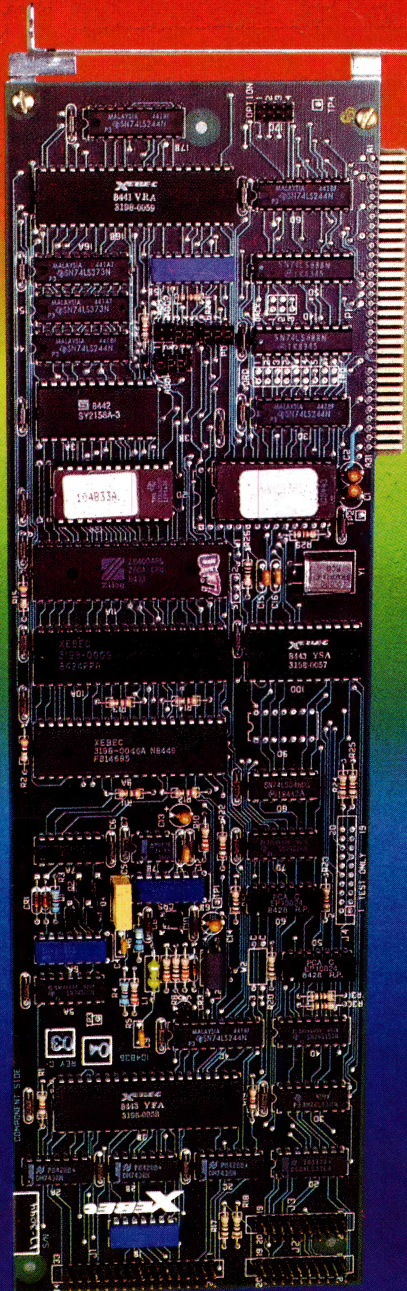
An affordable Winchester for your IBM

If you want to
talk Winchester
and Controllers...
Talk to ACT



SAVE
hundreds of
dollars when
you buy direct
from the wholesaler!

FROM
\$1595
(Includes all taxes)



- 10-31 megabytes
- Boots directly to Winchester
- 1 year warranty
- Don't wait months, buy ex-stock
- ACT is an Australian organisation committed to backup support and service

A DIVISION OF AUSTRALIAN PROTECTION INDUSTRIES

act

Australian Computer and Telecommunications
75 Willoughby Road, Crows Nest, NSW 2065.
Telephone 02 439 6300, Telex AA 24816

1985 — 1986

ANNUAL REPORT

WILL
CORP

Excel

The new measure of corporate performance
that takes the Macintosh all the way to the boardroom.
Microsoft Excel:
Now available from your Microsoft dealer.
Details (008) 22 6850 or (02) 452 5088.

MICROSOFT®